ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



James W. Warr, Director

Jim Folsom Governor

Mailing Address: PO BOX 301463 MONTGOMERY AL 36130-1463

August 1, 1994

Physical Address: 1751 Cong. W. L. Dickinson Drive Montgomery, AL 36109-2608

Mr. Brian Farrier CERCLA PA/SI State Project Officer USEPA Region IV 345 Courtland Street, N.E. Atlanta, Georgia 30365

(205) 271-7700 FAX 270-5612

Dear Mr. Farrier:

Field Offices:

110 Vulcan Road Birmingham, AL 35209-4702 (205) 942-6168 FAX 941-1603

Kay Fries, Inc.

400 Well Street P.O. Box 953 Decatur, AL 35602-0953 (205) 353-1713 FAX 340-9359 Please advise us when this report has been evaluated and a determination has been made concerning its acceptability. Should you have questions or require assistance in evaluating this report, please do not hesitate to contact our staff.

2204 Perimeter Road Mobile, AL 36615-1131 (205) 450-3400 FAX 479-2593

Jymalyn E. Redmond, Chief Site Assessment Unit

Sincerely,

JER/tpc

AUG 0 8 1994

VVF L CIL



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

July 29, 1994



James W. Warr, Director

Jim Folsom Governor

Mailing Address:

PO BOX 301463

MONTGOMERY AL

36130-1463

Mr. Brian Farrier

EPA CERCLA PA/SI Regional Project Officer

Physical Address: 1751 Cong. W. L.

Site Investigation Support Section Waste Management Division

Dickinson Drive Montgomery, AL 36109-2608

US. EPA Region IV 345 Courtland Street

Atlanta, GA 30365

(205) 271-7700 FAX 270-5612

RE: Site Investigation / Kay Fries

Mobile County, Alabama -- EPA ID # ALD000608224

Field Offices:

110 Vulcan Road Birmingham, AL 35209-4702

(205)942-6168

FAX 941-1603

400 Well Street P.O. Box 953 Decatur, AL

35602-0953 (205) 353-1713 FAX 340-9359

2204 Perimeter Road Mobile, AL 36615-1131 (205) 450-3400

FAX 479-2593

Dear Mr. Farrier:

Enclosed please find a copy of the SI narrative, references, and SI Worksheet for the Kay Fries site located in Mobile county. If you have any questions, please call me at 205/260-2712.

Sincerely,

Clayton N. Scott Compliance Section Field Operations

cc: Jymalyn Redmond



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



Jim Folsom Governor

James W. Warr, Director

July 29, 1994

Mailing Address: PO BOX 301463

MONTGOMERY AL 36130-1463

Mr. Brian Farrier

EPA CERCLA PA/SI Regional Project Officer

Site Investigation Support Section Waste Management Division

Physical Address: 1751 Cong. W. L.

US. EPA Region IV 345 Courtland Street

Dickinson Drive Montgomery, AL 36109-2608

Atlanta, GA 30365

(205) 271-7700 FAX 270-5612

FAX 404/347-4862

Field Offices:

RE: Site Investigation / Kay Fries d/b/a Huls

Mobile County, Alabama -- EPA ID # ALD000608224

110 Vulcan Road Birmingham, AL 35209-4702 (205) 942-6168 FAX 941-1603

Dear Mr. Farrier:

400 Well Street P.O. Box 953 Decatur, AL 35602-0953 (205) 353-1713 FAX 340-9359

On July 29, 1994, two copies of the above referenced SI was forwarded to Jymalyn Redmond of ADEM's Special Projects. Each copy has a SI narrative, references and SI Worksheet for the site. If you have any questions regarding this report, please call me at (205) 260-2712.

2204 Perimeter Road Mobile, AL 36615-1131 (205) 450-3400 FAX 479-2593

Sincerely,

Clayton N. Scott Compliance Section Field Operations Division

Site Investigation Kay Fries, Inc. Mobile County, Alabama EPA ID # ALD000608224

Prepared by

Alabama Department of Environmental Management Field Operations Division

July 1994

Site Investigation Kay Fries d/b/a Huls Mobile County, Alabama EPA ID # ALD000608224

Prepared by _____ C.N. Scott

Site Investigation
Kay Fries, Inc.
Mobile County, Alabama
EPA ID # ALD000608224

TABLE OF CONTENTS

Introduction	1.0
Site Description	2.0
Location	2.1
Historical	2.2
Waste/Source Characterization	2.3
Ground Water Pathway	3.0
Hydrogeology	3.1
Targets	3.2
Surface Water Pathway	4.0
Hydrology	4.1
Targets	4.2
Soil Exposure and Air Pathways	5.0
Site Conditions	5.1
Targets	5.2
Summary and Conclusions	6.0

Site Investigation
Kay Fries d/b/a Huls
Mobile County, Alabama
EPA ID # ALD000608224

1.0 INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA) the Alabama Department of Environmental Management (ADEM), Field Operations Division, conducted a Site Investigation (SI) of the Kay Fries site.

The purpose of the investigation was to assess the threat this site may pose to human health and to the environment. Existing regulatory files concerning this site, including any past CERCLA reports were evaluated utilizing the Hazard Ranking System (HRS).

2.0 SITE DESCRIPTION

Kay Fries site is an active regulated site (RCRA, CWA and CAA) at this writing doing business as Huls America, Inc. The facility is located on a 160 acre tract of land in the Theodore Industrial Park, about 15 miles south of Mobile Alabama. Kay Fries was acquired and reorganized in 1988 and the name changed to Hul America, Inc. at that time. Kay Fries manufactures organic chemical intermediates which typically include orthoesters and organo-functional silanes as intermediary reagents for the chemical and pharmaceutical industries. Major starting reagents or feedstocks utilized by Kay Fries include methanol, ethanol, acetonitrile, cyanide, diethylbenzene, silicon tetrachloride, trichlorosilane, additional silanes and acids.[1,2]

2.1 Location

The site is located in Mobile County south of Theodore, section 23 of Township 6 South, Range 2 West. at a the approximate coordinates: latitude 30° 30' 45" and longitude 88° 08' 30".[3]

Generally, the setting is industrial with several other large chemical or manufacturing facilities within 3 miles of Kay Fries. Suburban areas associated with Theodore/Mobile exist in the 1 mile to 4 mile radii, primarily toward the north west. Other inhabited areas include the community of South Orchard, located 3 to 4 miles south of the site. Dykes Creek is located adjacent to the sites eastern side with associated wetlands and Muddy Creek is located approximately 0.6 miles to the west of the facility. [3]

2.2 Historical/Ownership

The facility was originally built in 1980 and was initially operated by a contractor. Kay-Fries, Inc., a subsidiary of Dynamit Nobel of America, Inc., purchased the facility in 1982. The ownership changed again in 1988, when Huls America, Inc. acquired Dynamit Nobel. The facility was reorganized and renamed at this time and is at this writing doing business as Huls America, Inc. Operations and personnel have been relatively unaffected.[1]

2.3 Waste/Source Characterization

Production of isophorones and other pharmaceutical/agricultural precursors from raw products or feedstocks including: methanol, ethanol, acetonitrile, cyanide, diethylbenzene, silicon tetrachloride and silanes.[1]

Groundwater sampling conducted with regard to this site revealed the presence of diethylbenzene releases to groundwater that was attributable to the equalization basin and the aeration basins. A closure plan for the two basins was submitted in June 1986 and amended October 1986. The units were approved clean closed by ADEM December 1987, however the units were not certified clean closed. Both units are still operational as of March 1994, although they no longer manage hazardous waste.[1]

3.0 GROUND WATER PATHWAY

3.1 Hydrogeology

The site is located in the Alluvial-Deltaic Plains physiographic section. The major underlying formation is the Miocence Series, undifferentiated, which is composed of gray, orange and red fine to course grained sand, red ferruginous sandstone, and sandy silty clay. The Miocene series, undifferentiated is about 2000 feet thick.. The main production zone in the immediate vicinity of the site is located in the Miocene/Pliocene aquifer in the sand units located near the base of the aquifer. The top of the aquifer generally occurs 125 to 150 feet below the land surface, with individual sand beds being 50 to 100 feet thick. The regional groundwater flow is south-southwesterly, the same direction as regional dip. Groundwater in this aquifer is recharged by precipitation in areas west and north of the facility. The water table aquifer may discharge to local streams and form swamps in topographic lows, such as near Dykes Creek to the east. Sand and gravel units are generally too thin around the facility for significant aquifer usage. However, small quantities of good quality water are available for domestic use.[1,2]

The monitoring well system at the facility consists of one upgradient and four down gradient wells drilled to a depth greater than or equal to 30 feet. Two additional wells exist, both downgradient that were drilled to a depth of 10 feet. In October 1985 diethylbenzene was found at significant levels in the shallow well (#6) and again in November 1987 the same well yielded 379 ug/L (ppb) during a compliance monitoring inspection. The same well yielded 410 ug/L during an April 1988 test. Since this time the analyte level has decreased with time and is no longer a RCRA concern. [1,4]

3.2 Targets -- Ground Water

Within four miles of the site, are several industrial water supply wells and one public water supply well. The public well belongs to the Mobile County Water and is about three miles north of the site. This well is 148 feet deep and screened in the alluvium. Mobile County Water Works services 3,920 connections (2.5 persons/connection based on county average) or about 9,800 individuals. [5,6]

4.0 SURFACE WATER PATHWAY

4.1 Hydrology

Facility/site drainage for the vast majority of the facility is eastward into Dykes Creek with minor drainage westward and into Muddy Creek. Both creeks flow generally southward and into Fowl River. The headwaters of Dykes creek appear to originate in adjacent lowlands located east-northeast of the facility. During the reconnaissance, Dykes Creek had no flow south southeast of the facility at Laurendine Road, and is thus considered intermittent. Mobile Bay lies approximately 2.5 miles east of the Kay-Fries facility. The facility is located in the Coastal Lowlands District and the Coastal Plain physiographic province above the 100 year flood plain. The area is best described as flat to gently undulating plains which are locally swampy. Topographic relief on the facility varies from approximately 30 to 40 feet above mean sea level. The area generally slopes gently toward the Mobile Bay to the east. [1]

The climate is described as subtropical, with long, hot, humid summers showing relatively stable temperatures. The coldest months are on average December through February, when there are frequent shifts between warm, moist Gulf air and cool, dry continental air masses. Precipitation averages about 65 inches per year. July through September are the wettest months with March also averaging 6.5 inches of rainfall. The driest months being October and November. The maximum daily rainfall recorded between 1951 and 1984 was 13.4 inches in April 1955.[1]

Approximately 5 miles of wetlands frontage (x2) are found associated with Muddy Creek south of the site until confluence with the Fowl River. [3]

4.2 Targets -- Surface Water

Endangered species that are known to exist or range in the area include the: Wood Stork, Alabama Sturgeon, Gulf Sturgeon, Alabama Red-Bellied Turtle and the Bald Eagle. [3] Of particular concern or habitat specific, within a four mile radius of the site are the Alabama Red-Bellied Turtle and the "Threatened" Gopher Tortoise. [7,8]

5.0 SOIL EXPOSURE AND AIR PATHWAYS

5.1 Site Conditions

An active major industry in the area, Huls employs about 200 individuals. Exposure to the employees that could be attributable to the closed basin is minimal, as travel around the basin is not necessary and only frequented by a few employees. [1]

5.2 Targets -- Soil Exposure & Air

With regard to soil exposure, time required for the aforementioned employees that would be found periodically around or near the basin, exposure is considered minimal or non-existent. The air pathway appears to pose no threat.

6.0 Summary and Conclusions

Huls is an active RCRA/CWA governed facility that exhibits observed releases that have impacted ground water in the area, however there are very few private potable supply wells identified within a four mile radius that could be adversely affected. As an active manufacturing facility, RCRA and CWA laws require regular monitoring of the waste streams generated by the facility. This site is recommended for consideration as SEA.

REFERENCES

refer to Appendix A

- 1. RCRA Facility Assessment Report November 1990
- 2. Preliminary Assessment, August 1984
- 3. 7.5 minute Topographic Maps with buffer zones
- 4. Conversation: Writer with RCRA Chief
- 5. County Population/Statistics
- 6. FRDS Database of Public Drinking Water Systems -- area excerpts
- 7. U.S. Fish and Wildlife review of "Endangered Species"
- 8. "Vertebrate Animals of Alabama in Need of Special Attention" excerpts

- APPENDIX A

REFERENCES

refer to Appendix A

- 1. RCRA Facility Assessment Report November 1990
- 2. Preliminary Assessment, August 1984
- 3. 7.5 minute Topographic Maps with buffer zones
- 4. Conversation: Writer with RCRA Chief
- 5. County Population/Statistics
- 6. FRDS Database of Public Drinking Water Systems -- area excerpts
- 7. U.S. Fish and Wildlife review of "Endangered Species"
- 8. "Vertebrate Animals of Alabama in Need of Special Attention" excerpts

RCRA Facility Assessment Report November 1990

Appendix B

Preliminary Assessment, August 1984 Appendix C

7.5 minute Topographic Maps with buffer zones

Appendix D

Conversation: Writer C. Scott with RCRA Chief B. Barr 7/27/94 Groundwater quality has improved since closure of the treatment units and the hazardous waste streams are now accounted for and transported off site for disposal.

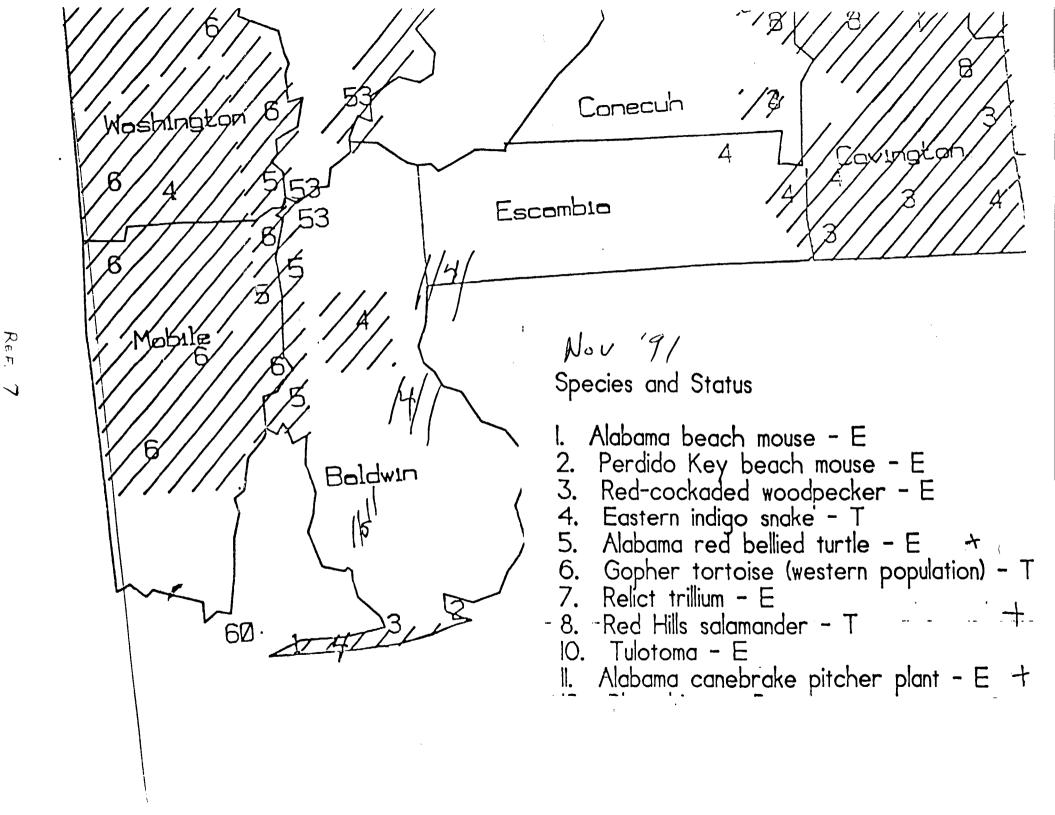
Table 1. Selected Population and Housing Characteristics: 1990 Mobile County, Alabama

The population counts set forth herein are subject to possible correction for undercount or overcount. The United States Department of Commerce is considering whether to correct these counts and will publish corrected counts, if any, not later than July 15, 1991. The user should note that there are limitations to many of these data. Please refer to the technical documentation provided with Summary Tape File 1A for a further explanation on limitations of the data.

		1	
Total population	378,64	Total housing units	151,220
SEX		OCCUPANCY AND TENURE	
Male	179,577	Occupied housing units	136,899
Female	199,066	C. Demos occupied	91,513
1 4md16	133,000	Percent owner occupied	66.8
AGE		Renter occupied	45,386
Under 5 years	29,633		14,321
5 to 17 years	78,400		. 7,521
			1,083
18 to 20 years 21 to 24 years	17,984		
	21,429		10.1
25 to 44 years 45 to 54 years	116,996	Rental vacancy late (percent)	10.1
55 to 59 years	37,951 15,727	Persons per owner-occupied unit	2.81
60 to 64 years	15,727	Berrons per center-occupied unit	2.52
65 to 74 years	26,622	Persons per renter-occupied unit Units with over 1 person per room	5,961
75 to 84 years	14,155	Omics with over 1 person per 1002	3,301
85 years and over	3,878	UNITS IN STRUCTURE	
Median age	31.9	l launit deteched	107,031
		l l-unit strached	2 678
Under 18 years	108.033	2 to 4 units	10.311
recent of total population	28.5	5 to 9 units	8.066
ears and over	44.655	10 or more units	10, 191
cent of total population	11.8	2 to 4 units 5 to 9 units 10 or more units Hobile home, trailer, other	12.943
Under 18 years Freent of total population Fars and over Freent of total population			_,-
Total households	136,899	Specified owner-occupied units	75,273
Total households Family households (families)	100,814	Less than \$50,000	34,210
Married-couple families	73,628	\$50,000 to \$99,999	32,696
Percent of total households	53.8	Specified owner-occupied units Less than \$50,000 \$50,000 to \$99,999 \$100,000 to \$149,999 \$150,000 to \$199,999 \$200,000 to \$299,999 \$300,000 or more Median (dollars)	5,171
Other family, male householder	4,309	\$150,000 to \$199,999	1,617
Other family, female householder	22,877	\$200,000 to \$299,9 99	1,049
Nonfamily households	36,065	5300,000 or more	530
		Median (dollars)	53,300
Householder living alone	31,851		
Householder 65 years and over	12,548	CONTRACT RENT	
		Specified renter-occupied units	
Persons living in households	371,562	paying cash rent	40,878
Persons per household		Less than \$250	22,940
CROID OHAPTERS		\$250 to \$499	16,910
GROUP QUARTERS Persons living in group quarters Institutionalized persons	7 001	\$300 to \$749 \$780 to \$000	798 98
Institutionalized manage	2,051	\$1,000 or more	132
Other persons in group quarters	3,331	Median (dollars)	233
orner bersons in Broch desirers	3,130	(lediam (dollars)	433
RACE AND HISPANIC ORIGIN	ł	RACE AND HISPANIC ORIGIN	
White	254,853		
Black	117,872	Occupied housing units	136,899
Percent of total population	31.1	White	96.804
American Indian, Eskimo, or Aleut	1,940	Black	38,408
Percent of total population	0.5	Percent of occupied units	28.1
Asian or Pacific Islander	3,398	American Indian, Eskimo, or Aleut	616
Percent of total population	0.9	Percent_of occupied units	0.4
Other race	580	Asian or Pacific Islander	893
Hispanic origin (of any race)	3,164	Percent of occupied units	0.7
Percent of total population	0.8	Other race	178
	ł	Hispanic origin (of any race)	1,06B
	1	Percent of occupied units	0.8

PW:	S	PWS	ACTIVITY	
ID.	PWS ID2	TYPE	FLAG	SYSTEM NAME
AL	0000245	-	A	HOLLINS WATER & FIRE PRO AUTHORITY
AL	0000719-		Α	HOLLYWOOD WATER WORKS
⊥ AL"	- 00007 21	N	-A	MUD CREEK CAFE 30 50 50
_ AL			A	GRAND MARINER MARINA
_ AL		-	I	BELLINGRATH GARDENS
AL	0000961	N	Α	SS MARINA RESTAURANT
- AL	0000969	N	Α	FOWL RIVER HARBOR, INC.
AL.	0000972-	~P	I	M-I DRILLING FLUIDS, CO.
AL		- P ······	· I	JEWISH COM. CENTER
ΑĽ		Ρ	Ι	FAITH ACADEMY
AL			- A	GREEN OAKS MOBILE HOME PARK
ΑL			I	FOUR STAR OIL & GAS CO
AL			I	INDIAN SPRINGS MOBILE VILLAGE
AL	0000998	С	I	MAGNOLIA TRAILER COURT
ΑL	0000999	P	Α	WESTWOOD MANOR/MOBILE MENTAL HEALTH
AL		P	T	BARBERS PURE MILK CO
AL	0001002	C	Α	MOBILE COUNTY WATER & FIRE PRO AUTHORITY
AL	0001005	С	Α	MOBILE WATER SERVICE SYSTEM
ΑL	0001007~		-A	-OLD-SHELL-MOBILE HOME PARK
AL	0001 010 -	C	I	PINE ACRES MOBILE HOME ESTATES
ΑL	0001018	C	A • • • •	RIDGEWOOD AGRES MOBILE HOME PARK
AL	0001032	P	Α	TANNER WILLIAMS ELEMENTARY SCHOOL
AL	0001040	С	I	WOODLAND OAKS TRAILER COURT
AL	0001452	C	I	WESTERN PARK
-AL	0001501-		- I	-INTERNATIONAL PAPER CO:
AL	0001745	-p		-YMCA OF METROPOLITAN MODILE, INC.

م محتر



and ecology of the species. Nothing is known of the ecology of adults when not breeding.

BASIS FOR STATUS CLASSIFICATION. The remarkable distribution of disjunct populations of this frog make it a subject valuable to the study of biogeography and evolution. In addition, the Alabama-Florida populations differ significantly from those of the Atlantic Coastal Plain in aspects of their morphology, ecology, and call structure. The ecology, distribution, and habitat of this species suggest that it was formerly more widespread during milder, wetter climates. If true, living populations of the Pine Barrens treefrog could be considered "physiological relicts," possibly best adapted to some Pleistocene climates.

Becar by 22 localities are known in Alabama and because the celebrate of the species delicate and rare habitats are those directed at a few places in Conecuh National Forest, the status of "Threatened" is warranted. In Florida, the frog was found to be much more common and widespread than was believed earlier, resulting in its being removed from the "Federal List of Endangered Species." That state nevertheless retains it on its list of "Species of Special Concern."

RECOMMENDATIONS. Fire is important in maintaining the integrity of the bog habitats, and periodic burning, preferably in late summer or fall, would greatly improve some of the marginally suitable habitats that may ultimately be lost otherwise. Attempts to drain the boggy areas or to convert them to hog wallows and ponds, common practices in the frog's range, should be avoided or discouraged.

Studies on the restrictive physiological breeding ecology of this species are needed, as well as investigations into the ecology of nonbreeding individuals, an aspect of the biology of this species about which almost nothing is known.

SELECTED REFERENCES

GOSNER, K. L. AND I. H. BLACK. 1967. Hyla andersonii. Cat. v. Amphib. Rept. 54.1-54.2.

KARLIN A., D. B. MEANS, S. I. GUTTMAN, AND D. D. LAMBRIGHT. 1982. Systematics and the Status of Hyla andersonii (Anura: Hylidae) in Florida. Copeia 1982(1):175-

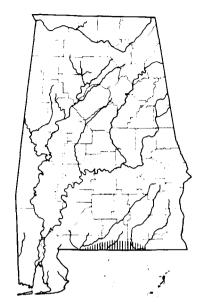
MEANS, D. B. AND C. J. LONGDEN. 1976. Aspects of the Biology and Zoogeography of the Pine Barrens Treefrog, Hyla andersonii, in Northern Florida. Herpetologica 32:117-130.

AND P. E. MOLER. 1979. The Pine Barrens Treefrog: Fire, Seepage Bogs, and Management Implications. In R. Odom and L. Landers eds. Proc. of the Rare and Endangered Wildlife Symp., Ga. Dept. Nat. Res., Game and Fish Div., Tech. Bull. WL 4:77-83.

MOLER, P. E. 1981. Notes on Hyla andersonii in Florida and Alabama. J. Herpetol. 15(4):441-444.

MOUNT, R. H. 1980. Distribution and Status of the Pine Barrens Treefrog, *Hyla andersonii*, in Alabama. Unpubl. Rept. to U. S. Fish and Wildl. Serv. 31 pp.

PREPARED BY: D. Bruce Means, Coastal Plains Institute, 1313 N. Duval St., Tallahassee, Florida 32303.



Range of Pine Barrens treefrog.

Threatened DUSKY GOPHER FROG

Rana areolata sevosa Goin and Netting Family Ranidae Order Salientia

OTHER NAMES. Dusky crawfish frog DESCRIPTION. A stout-bodied, spotted frog up to 10 cm (4 inches) head-body length, with a rather large head and a

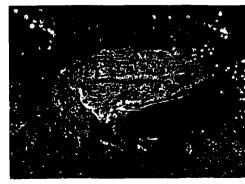


FIG. 25. Dusky gopher frog (Robert H. Mount).

thick ridge of skin extending down the back behind each eye. The toes taper to rounded points and the snort is somewhat pointed. Back rough-textured, gray or light brown with dark blotches and smaller dark markings. Belly and throat whitish with numerous small spots and vermiculations; inner surfaces of hind leg and adjacent belly portions washed with yellow.

RANGE. The gopher frog complex of subspecies of the species *R. areolata* occurs from Louisiana to Florida and northward in the Coastal Plain to North Carolina. The ranges of the various subspecies and zones of intergradation between them are not well known. In Alabama, all populations of *R. areolata* are tentatively assigned to the subspecies *R. a. sectosa*. The few Alabama records are from Mobile, Baldwin, Escambia, Covington, and Barbour counties. In addition, the existence of a population in Shelby County, far removed from the others and until recently considered questionable, has been verified by the discovery of a second specimen in the same general area where the first was found (Guthrie, 1885)

HABITAT. Open longleaf pine-scrub oak forests developed on sandy soils, the favored habitat of the gopher tortoise (Gopherus polyphemus) in Alabama, is probably the principal habitat of this poorly known and secretive frog. The highly terrestrial, metamorphosed frog lives sometimes up to 1 mile from open water and spends its days underground in tortoise burrows, mammal burrows, and possibly to some extent in crawfish holes. At night it emerges to feed on insects and other small animals.

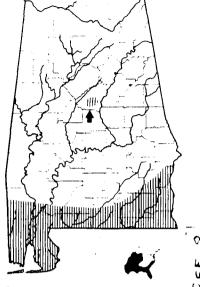
LIFE HISTORY AND ECOLOGY. Breeding occurs usually in February and March in temporary ponds, ditches, and borrow pits, but the species may be able to breed "explosively" at any time of the year following umusually heavy rains. Males emit a distinctive snoring call that can be heard at least 0.5 km away. Females may not breed every year, but lay hundreds of eggs when they do. The greenish yellow tadpole is large, full-bodied, long-tailed, and spotted over the upper surface and tail fin. Transformation occurs in 90-120 days and the small froglets are believed to migrate to dry terrestrial habitats to grow to maturity.

BASIS FOR STATUS CLASSIFICATION. Because of the small number of populations known in Alabama, rapid decline in amount and quality of breeding and non-breeding habitat, and its close association with the threatened gopher forog is considered threatened.

RECOMMENDATIONS. Much remains to be learned about this secretive frog. Studies of its breeding cycle, population biology, and larval ecology should be undertaken in conjunction with a thorough survey to determine the seriousness of its status in Alahama. In addition, efforts should be made to educate land managers and the general public on matters relating to the importance and conservation of the longleaf pine-scrub oak (sandhill) ecological association in Alabama. Any known breeding sites for gopher frogs should be called to the attention of the owners or managers of the lands on which the sites occur to ensure against inadvertent or needless destruction.

SELECTED REFERENCES

ALTIG. R. AND R. LOHOEFENER. 1983. Rana areolata. Cat. Amer. Amphib. Rept. 324.1-324.4.



Range of the gopher frog-crawfish frog complex.

GOIN, C. J. AND M. GRAHAM NETTING. 1940. A New Gopher Frog from the Gulf Coast, with Comments upon the Rana areolata Group. Ann. Carnegie Mus. 28:137-169. GUTHRIE, R. F. 1985. Geographic Distribution: Rana areo

lata secosa. SSAR Herp. Review 16:31.

MOUNT, R. H. 1975. The Reptiles and Amphibians of Alabama. Ala. Agr. Expt. Sta., Auburn. 347 pp.

NEILL, W. T. 1957. The Status of Rana capito sterten-Schwartz and Harrison. Herpetologica 13:47-52.

VOLPE, E. P. 1957. The Early Development of Rana capito serosa. Tulane Stud. Zool. 5(9):207-255.

PREPARED BY: D. Bruce Means. Coastal Plains Institute, 1313 N. Duval St., Tallahassee, Florida 32303.

Threatened

EASTERN HELLBENDER

Cryptobranchus alleganiensis alleganiensis (Daudin) Family Cryptobranchidae Order Caudata

OTHER NAMES. Mudpuppy, mud-dog, waterdog, water lizard, and walking catfish.

DESCRIPTION. The hellbender is a very large aquatic salamander, reaching a maximum total length of 74 cm (ca. 15 inches). The trunk and head are dorso-ventrally flattened, and the tail muscular, well developed, and laterally compressed. Between front and hind limbs are extensively vas-

components of the range, where losses have been most severe. Memoranda of understanding similar to that executed with L.P.C. should be secured, whenever possible, from landowners. Educational efforts directed at enhancing the weifare of the Red Hills cove and ravine fauna and flora would be helpful.

SELECTED REFERENCES

Brandon, R. A. 1965. Morphological Variation and Ecology of the Salamander *Phaeognathus hubrichti*. Copeia 1965:67-71.

ichti (Red Hills Salamander), Reproduction, Herp. 13(2):46.

FRENCH, T. W. AND R. H. MOUNT. 1978. Current Status of the Red Hills Salamander, *Phaeognathus hubrichti* Highton, and Factors Affecting its Distribution. J. Ala. Acad. Sci. 49:172-179.

JORDAN, J. R., JR. 1975. Observations on the Natural History and Ecology of the Red Hills Salamander. *Phaeognathus hubrichti* Highton (Caudata: Plethodontidae). M.S. thesis, Auburn Univ., Auburn. Alabama. 59 pp.

SCHWANER, T. D. AND R. H. MOUNT. 1970. Notes on the Distribution and Ecology of the Salamander Phaeognathus hubrichti Highton. Copeia 1970:571-573.

PREPARED BY: Robert H. Mount, Department of Zoology-Entomology, Auburn University, Alabama 36849.



Range of the Red Hills salamander.

Threatened SOUTHERN HOGNOSE SNAKE

Heterodon simus (Linnaeus) Family Colubridae Order Squamata Suborder Serpentes

OTHER NAMES. Puff adder, spreading adder, and ground rattler.

DESCRIPTION. A short, stout snake attaining a maximum length of 640 mm (24 inches), but averaging 360-510 mm (14-20 inches). Snout shovel-shaped and sharply upturned, underside of tail and belly about the same color. (In the eastern hognose, the snout is pointed, but not conspicuously upturned, and the tail undersurface is usually lighter than the belly.) Back with mid-dorsal dark blotches, these alternating with smaller dorsolateral blotches. Ground color gray, brown, or yellowish, often with tinges of red between dorsal blotches. Melanistic (black) individuals unknown.



FIG. 28. Southern hognose snake (Robert II. Mount).

RANGE. Generally, the Coastal Plain from North Carolina to southern Florida and southern Mississippi. In Alabama records are available from Butler, Clarke, Baldwin, Escambia, Covington, and Dale counties in the southern portion: Autauga and Shelby counties in the central portion: and Calhoun County in the northeastern portion. The Shelby and Calhoun county localities are in the Ridge and Valley Region, above the Fall Line.

HABITAT. Open woods, fields, and waste places having relatively sandy soils. Most specimens have been found in dry situations, although one was recently picked up while swimning in the open water of Lake Eufaula (Ed Wester, per comm.), near the Georgia shore.

LIFE HISTORY AND ECOLOGY. The natural history of this snake remains poorly known. Some observations suggest that it is more inclined to be fossorial (burrowing) than its more common relative, the eastern hognose. Like the latter, the southern hognose often displays a fearsome appearance and a menancing behavior when molested—hissing, blowing, and spreading the head and neck in cobralike fashion. These manifestations belie the snake's true demeanor—for if the molestation continues, it rolls over, feigns death, and stead-fastly refuses to bite its tormentor.

The southern hognose is oviparous, but natural nests are unknown. Data suggest that clutch size ranges from 6-10. Apparently, the diet is limited almost exclusively to toads.

BASIS FOR STATUS CLASSIFICATION. Although the southern hognose may never have been particularly common

in Alabama, it could until a decade or so ago be found in a few places in the State with some regularity. This appears to be no longer the case, and population densities today are believed to be at an all-time low. Reasons for the decline are not apparent. Imported fire ant predation on the eggs and/or young is believed by one herpetologist to be a factor in the decline. Persecution by man and highway mortality may be contributing.

RECOMMENDATIONS. A comprehensive status survey is needed, as are studies to determine limiting factors. This snake would profit, as would most other harmless snake species, from educational programs designed to develop a greater environmental awareness on the part of Alabama's citizens and its leaders.

SELECTED REFERENCES

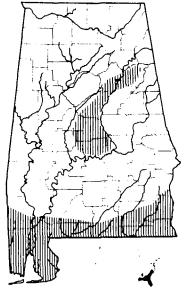
EDGREN, R. A. 1955. The Natural History of the Hog-nosed Snakes, Genus Heterodon: A Review. Herpetologica 11:105-117.

MOUNT, R. H. 1975. The Reptiles and Amphibians of Alabama. Ala. Agr. Expt. Sta., Auburn, 347 pp

. 1980. Survey for the Presence or Absence of Threatened or Endangered Reptiles and Amphibians. Conecuh National Forest, Alabama, Unpubl. Rept. to U. S. For. Serv. 108 pp.

. 1981. The Red Imported Fire Ant. Solenopsis incicta (Hymenoptera: Formicidae), as a Possible Serious Predator on Some Native Southeastern Vertebrates: Direct Observations and Subjective Impressions. J. Ala. Acad. Sci. 52:71-78.

PREPARED BY: Robert H. Mount, Department of Zoology-Entomology, Auburn University, Alabama 36849.



Range of the southern homose snake

Threatened

BLACK PINE SNAKE

Pituophis melanoleucus ladingi Blanchard Family Colubridae Order Squamata Suborder Serpentes

OTHER NAMES. Black bull snake.

DESCRIPTION. Large, attaining a maximum total le of 188 cm (74 inches). Bostral scale (at snout tip) enlar curving backward and ending in a point between nosicolor of adults almost uniform black or dark brown, wit occasional individual having a few white scales and/or tral a pattern: young tend to be patterned, with black blotchia brown background, on the posterior three-fourths obody. Scales on body keeled. (The only other black sn found within the range of the black pine snake are the I racer and eastern indigo snake, both of which have sn. body scales).



FIG. 29. Black pine snake (Robert H. Mount).

RANGE. Southern Mississippi, extreme southea Louisiana (?), and southwestern Alabama, where it has recorded from Mobile, Clarke, and Washington com The snake may ultimately be found in southern B County. The black pine snake intergrades with the Fl pine snake, in Alabama, in Baldwin, Escambia, and Co ton counties.

HABITAT. Most often found in areas with sandy, drained soil. Sandhill (longleaf pine-scrub oak) associa and similar habitats, and relatively small openings in places, seem well suited.

LIFE HISTORY AND ECOLOGY. Aside from a few eral observations, little is known of this rare snake in it ural environment. It is believed to spend considerable underground, in burrows of gopher tortoises and rodent-possibly in some it constructs itself. Principal foods ar lieved to be rodents, birds, and bird's eggs.

The black pine snake has been bred successfully in city. In a detailed account of such, courtship and matineurred in late April, oviposition of 7 eggs occurred (May, and hatching 65-68 days later.

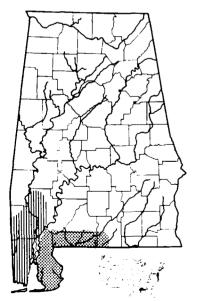
BASIS FOR STATUS CLASSIFICATION. Black snakes have declined substantially in Alabama durin past 15-20 years. No longer can they be found with an gree of predictability, as was the case previously. In an i sive search for the snakes in Alabama during the warm season of 1982 by employees of the U. S. Fish and Wildlife Service (561 km driven and 64.4 hours spent), no black pine snakes were found, living or dead.

Reasons for the decline are unknown. All or a combination of the following may be involved: gassing of gopher tortoise burrows, deliberate killing or collecting, highway mortality, detrimental forestry practices (e.g. mechanical site preparation, use of herbicides, institution of artificial burning regimes), and detrimental agricultural practices.

RECOMMENDATIONS. The habits of the black pine snake should be investigated, using telemetry and the new technique for investigating burrows and cavities (see Speake and ve, 1983). A more thorough status survey, employing the should be conducted. Appropriate conservation education programs should be implemented. The impact of forestry practices now being employed within the snake's range should be investigated. Legal protection against commercial exploitation should be instituted immediately, since black pine snakes command a premium price in the "pet trade." A ban on collecting and/or possession of black pine snakes, except for scientific or educational purposes, would be helpful.

SELECTED REFERENCES

CONANT, R. 1956. A Review of Two Rare Pine Snakes of the Gulf Coastal Plain. Amer. Mus. Nov., No. 1781:1-31. JENNINGS, R. D. AND T. H. FRITTS. 1983. The Status of the Black Pine Snake Pituophis melanoleucus lodingi and the Louisiana Pine Snake Pituophis melanoleucus ruthveni.



Range of the black pine snake (shaded). Stippled area indicates a zone of intergradation with the Florida pine snake.

Unpub. Rept. to U.S. Fish and Wildl. Serv. 32 pp. MOUNT, R. H. 1975. The Reptiles and Amphibians of Alabama. Ala. Agr. Expt. Sta., Auburn. 347 pp.

REICHLING, S. 1982. Reproduction in Captive Black Pine Snakes, *Pituophis melanoleucus lodingi*. Herp. Rev. 13(2):41.

SPEAKE, D. W. AND J. A. ALTIERE. 1983. A Device for Filming the Contents of Tree Cavities. Proc. Snag Hab. Mgt. Symp., Flagstaff. 185-187.

PREPARED BY: Robert H. Mount, Department of Zoology-Entomology, Auburn University, Alabama 36849.

Threatened FLORIDA PINE SNAKE

Pituophis melanoleucus mugitus (Barbour) Family Colubridae Order Squamata Suborder Serpentes

OTHER NAMES. Bull snake, gopher snake. DESCRIPTION. One of Alabama's largest snakes, attaining a maximum length of about 229 cm (90 inches). Color varies from light gray anteriorly to rusty-brown posteriorly; dorsal blotches are usually indistinct anteriorly, but brown to rust-colored blotches may be distinct posteriorly. Like the other pine snakes in Alabama, the body is moderately stout and the rostral scale is enlarged. (See description of P. m. melanoleucus.)



FIG. 30. Florida pine snake (Ray E. Ashton, Jr.).

RANGE. Florida, southern Georgia, southeastern Alabama, and extreme southern South Carolina. In Alabama, specimens have been collected from Russell, Covington, and Crenshaw counties. Intergrades with the black pine snake and the northern pine snake in southwestern and central Alabama, respectively. (See accounts of those subspecies.)

HABITAT. Usually found in the sandhill habitat where longleaf pine (*Pinus palustris*) and scrub oaks are dominant and gopher tortoises and pocket gophers occur. Clearings in such areas, especially abandoned fields, may also be inhabited.

LIFE HISTORY AND ECOLOGY. This snake is known to commonly use burrows of gopher tortoises and pocket gophers as shelters. The diet includes rodents, birds, and eggs of birds and reptiles. As with other pine snakes, P. m. mugtus is believed to spend much of its time underground. Ob-

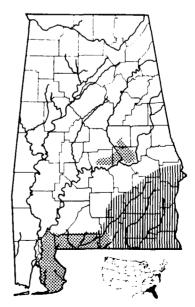
servers have reported clutches of eggs of from 4 to 8 white to cream-colored eggs.

BASIS FOR STATUS CLASSIFICATION. Florida pine snakes have always been of local occurrence and cannot be said to be common anywhere in Alabama. The sandhill habitat is being lost and altered at a rate that should elicit concern for all of its biotic components. Since the Florida pine snake is a well-known user of gopher tortoise burrows, it is especially vulnerable in areas where the practice of "gassing" these burrows to drive out rattlesnakes is common. Research on some ecological effects of "gassing" tortoise burrows has shown that Florida pine snakes gassed in the burrows with gasoline fumes died within 24 days.

RECOMMENDATIONS. The movements and habitat requirements of this snake in Alabama are poorly known and should be investigated with radio telemetry techniques and also as a part of research into the value of burrows of gopher tortoises and pocket gophers to wildlife. Newly developed equipment will permit visual examination of the burrows' innermost recesses. Establishment of some sandhill sanctuaries would benefit the snake as would restrictions on tortoise burrow gassing.

SELECTED REFERENCES

LANDERS, J. L. AND D. W. SPEAKE. 1980. Management Needs of Sandhill Reptiles in Southern Georgia. Proc. Ann Conf. S. E. Assoc. Fish and Wildl. Agencies 34:515-529.



Range of the Florida pine snake (shaded). Stippled area in southern Alabama indicates a zone of intergradation with the black pine snake; that in central Alabama, one with the northern pine snake.

MOUNT, R. H. 1975. The Reptiles and Amphibians of bama. Ala. Agr. Expt. Sta., Auburn. 347 pp.

SPEAKE, D. W. AND R. H. MOUNT. 1973. Some Possi Ecological Effects of Rattlesnake Roundups in the Soc eastern Coastal Plain. Proc. Ann. Conf. S. E. Ass Game and Fish Comm. 27:267-277.

, J. A. McGliney, and R. E. Hawkins. 19 The Use of Radio Transmitters for Field Study of East Indigo Snakes. In Proc. 2nd Ann. Int. Conf. on Wildl. I telemetry. F. M. Long (ed). Univ. of Wyoming, Laran pp. 128-134.

WRIGHT, A. A. AND A. H. WRIGHT. 1957. Handbool Snakes of the United States and Canada. Comstock Pt Assoc., Ithaca, N.Y. 1,105 pp.

PREPARED BY: D. W. Speake, Alabama Coopera Fish and Wildlife Research Unit, Auburn University, bama 36849.

Threatened BARBOUR'S MAP TURTLE

Graptemys barbouri Carr and Marchand Family Emydidae Order Testudines

OTHER NAMES. Barbour's Sawback Turtle. DESCRIPTION. This large, aquatic turtle exhibits a markable degree of sexual dimorphism. Females attain c pace lengths of 20 to 30 cm (8 to 12 inches) and develop a sive heads that appear disproportionate to their bodies. males are relative dwarfs by comparison; they rarely ex-13 cm (5 inches) and achieve only 20 percent of the body i of the average female. Carapace with a median keel actuated by prominent, black-tipped spines or knobs on sec through fourth vertebrals. These spines become incons nous in adult females. Carapace typically olive-green v light yellow, circular to C-shaped markings on costals marginals, these markings frequently obscured in older males as the ground color darkens. Plastron pale vellow unmarked except for narrow dark lines along the s (seams). Head has an olive-green background with a la yellowish to pale green blotch behind each eve. Chin with isolated light bar paralleling the jaw, followed by a light. verted, U-shaped mark. Limbs and tail striped.

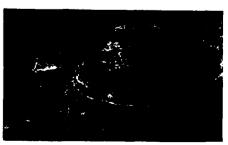


FIG. 31. Barbour's map turtle, adult female (Robert H. Mount).

RANGE. The species is restricted to the Apalachicola River system. This includes the Chipola (from which it was first described in 1952) and Apalachicola rivers in Florida, the Flint River in Georgia, and the Chattahoochee River along the Alabama-Georgia border. In the last it occurs northward at least to Russell County but is exceedingly scarce throughout. Some Alabama tributaries of the Chattahoochee and Chipola rivers are possibly inhabited.

HABITAT. Graptemys barbouri is exclusively a turtle of rivers and associated habitats. Greatest numbers occur along stretches with considerable amounts of exposed limestone and abundant snags and stumps for basking. Occasionally the species may be found in river swamps or impoundments, but

abitats seem suboptimal.

L HISTORY AND ECOLOGY. Barbour's map turtle is wholly carnivorous. Diets of males and small females consist principally of caddisfly larvae and other aquatic insects. Adult females use the massive head musculature and expanded oral crushing surfaces to feed almost exclusively on molluses, particularly native snails of the genus Elimia and the introduced bivalve, Corbicula manilensis.

Nesting occurs during late spring and early summer with most adult females presumably nesting three to four times during this period. Four to 11 eggs typically are laid in a cavity a few centimeters beneath the surface, within a few meters of the water, on sandbars and riverbanks. Although males may mature in 3 to 4 years, females may take as long as 15 to

20 years to achieve sexual maturity.

BASIS FOR STATUS CLASSIFICATION. Restriction to a single drainage system makes any species highly vulnerable. The Apalachicola River system repeatedly has been impounded for reservoirs, dredged for barge traffic, and poisoned and otherwise polluted through human negligence. Additionally, female Graptemys barbouri have been depredated by man in the past for food. Although effects of these multiple threats to the species have not been analyzed, their impact on a late-maturing, molluse-feeding species could be severe. The species also has considerable demand in the pet

RECOMMENDATIONS. Populations of this species should be surveyed and monitored throughout the range to obtain baseline data against which the effects of the aforementioned threats can be measured. Pollution and dumping in the rivers should be kept at a minimum. Collecting, except for valid scientific research, should be prohibited, and shooting the turtles should be made illegal. The impact of using "bush hooks" may be substantial in some places, and consideration should be given to regulating such use.

SELECTED REFERENCES

CAGLE, F.R. 1952. The Status of the Turtles Graptemys pulchra Baur and Graptemys barbouri Carr and Marchand, With Notes on Their Natural History. Copeia 1952:223-234.

CARR, A.F. 1952. Handbook of Turtles: Turtles of the United States, Canada, and Baja California. Comstock Publ. Assoc., Ithaca, New York. 542 pp.

and L. J. Marchand. 1942. A New Turtle From



Range of Barbour's map turtle.

the Chipola River, Florida. Proc. New England Zool. Club 20:95-100.

SANDERSON, R. A. 1974. Sexual Dimorphism in the Barbour's Map Turtle, *Malaclemys barbouri* (Carr and Marchand). M. S. Thesis, Univ. South Florida, Tampa.

WAHLQUIST, H. AND G. W. FOLKERTS. 1973. Eggs and Hatchlings of Barbour's Map Turtle, *Graptemys barbouri* Carr and Marchand. Herpetologica 29:236-237.

PREPARED BY: Dale R. Jackson, Florida Natural Areas Inventory, 254 East Sixth Avenue, Tallahassee, Florida 32303

Threatened ALABAMA RED-BELLIED TURTLE

Pseudemys alabamensis Baur Family Emydidae Order Testudines

OTHER NAMES. Red-belly.

DESCRIPTION. A large freshwater turtle attaining a carapace length of 335 mm (13.2 inches) in females and 295 mm (11.6 inches) in males. Shell high-domed and thick. Carapace oval, slightly serrated behind and wrinkled, becoming increasingly so anteriorly. Prominent oblique rugosities develop with age on outer margins of costal scutes. Background carapace coloration greenish, olive, brown, or black; vertical

markings on costals and marginals cream, yellow, orange, or red. Plastron and bridge large, rigid, the surfaces grainy in large individuals. Plastron plain to ornate, the markings consisting of dark bars and variously shaped dark figures that may be isolated or interconnected. Plastral ground color cream, yellow, orange, or red. Soft parts and head deep olive to black with cream or yellow striping.

Terminal notch of upper jaw normally flanked on each side by distinct toothlike cusp, a feature found in no other *Pseu*demus turtle in Alabama.



FIG. 32. Alabama red-bellied turtle (Robert H. Mount).

RANGE. Currently considered by most authorities to occur only in Alabama, where it is found chiefly in the lower portion of the Mobile Bay drainage in Mobile and Baldwin counties. Other records include Little River State Park Lake, Monroe County, and Dauphin Island, Mobile County, the latter doubtless represented by a waii. "Records" from Florida are believed to be P. concinna. P. floridana. or P. nelsoni, and those from Texas and Tennessee are probably misidentified P. concinna. Reports of this species' occurring in the lower Pascagoula River Drainage in Mississippi are being investigated. A status survey of the species has recently been completed. (See Addendum.)

HABITAT. This turtle is most abundant in fresh to moderately brackish water in a stretch of the Tensaw River between Hurricane Landing and the causeway across the northern part of Mobile Bay. Areas where submerged aquatic vegetation is abundant are preferred.

LIFE HISTORY AND ECOLOGY. The species is primarily if not exclusively herbivorous. Gravine Island, Baldwin County, is believed to be the primary nesting site, where nesting occurs during a period of about 3 months. Clutch size is between 4 and 9; average number of nestings per female per season is unknown. Nothing is known about growth, age to maturity, courtship, mating, or population dynamics.

BASIS FOR STATUS CLASSIFICATION. This species has declined noticeably within the past 1 to 2 decades. The animal is trapped and netted for food. On Gravine Island, fish crows take an extremely high proportion of the eggs, as humans and hogs once did, and recent research indicates a high rate of egg predation by the imported fire ant. Recreationists using the island disrupt the turtle's nesting inadvertently. The beds of elodea (Anacharis sp.) and other aquatic vegetation in the Tensaw River, believed to be an important food source, have declined recently, perhaps as a result of herbicide application. Alligators, known to prev on emvdid turtles.

have increased substantially in the turtle's range and t contributing to the decline. "Snagging" decreases b site availability, and heavy boat traffic on the river n deleterious. These factors, along with species' very range, warrant the indicated status.

RECOMMENDATIONS. Additional studies on the cies' life history and ecology are needed. Serious contion should be given to acquiring Gravine Island for a manctuary for this species and several other turtle inhal of the lower Tensaw River area. Meanwhile, the use obicides in the aquatic habitats in the area should be diaged, and snagging done only where absolutely need Commercial collecting of this species should be made to ful.

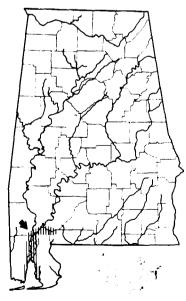
SELECTED REFERENCES

DOBIE, J. L. 1985. Distribution and Status of the Al Red-bellied Turtle, *Pseudemys alabamensis* Baur. U rept. to U.S. Fish and Wildl. Serv.

ERNST, C. H. AND R. W. BARBOUR. 1972. Turtles United States. Univ. Press of Ky., Lexington. 347 p. MOUNT, R. H. 1975. The Reptiles and Amphibians of banna. Ala. Agr. Expt. Sta., Auburn. 347 pp.

PRITCHARD, P. C. H. 1978. Alabama Red-bellied T Pages 71-73 in R. W. McDiarmid, ed. Rare and Egered Biota of Florida, Vol. 3: Amphibians and Re-Univ. Presses of Fla., Gainesville.

PREPARED BY: James L. Dobie, Department of Zo Entomology, Auburn University, Alabama 36849.



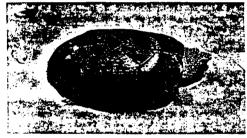
Range of the Alabama red-bellied turtle

Threatened FLATTENED MUSK TURTLE

Sternotherus minor depressus Tinkle and Webb Family Kinosternidae Order Testudines

OTHER NAMES. None.

DESCRIPTION. A small freshwater turtle attaining a maximum carapace length of 119 mm (ca. 4.75 inches). Carapace flattened, with scutes overlapping; plastron relatively small, the anterior lobe slightly movable; pectoral scute of plastron quadrangular or rectangular, normally one gular sent; chin with barbels. Carapace color brown, with darl these becoming less conspicuous or absent on old individuals. Limbs and tail brown, unstriped. Top of head greenish with a reticulum or network of dark markings, this often changing to form spots or blotches on top of snout. Head may or may not be enlarged in adults. Plastron pink in young. vellowish in adults. (Note: Occasional individuals of other Alabama musk turtles, especially older ones, exhibit flattening of the carapace, especially in habitats similar to those exploited naturally by depressus. This is probably the result of convergent evolution.)



Viattened musk turtle (Robert H. Mount).

RANGE. An Alabama endemic, the flattened musk turtle is found only in acceptable habitats in the upper portion of the Black Warrior River system, upstream from Bankhead Dam. A zone of intergradation between it and the stripenecked musk turtle, S. m. peltifer, occurs in the Warrior system from Holt Reservoir to the vicinity of Tuscalousa. This zone includes North River and several tributaries to Holt Reservoir. (Note: Some authorities contend that depressus is a distinct species.)

HABITAT. The turtle occurs in free-flowing streams and stream impoundments having some shallow water, substrates with some rock or cobble, and sufficient invertebrate life, preferably in the form of molluscs, for food. Relatively small creeks as well as larger streams are inhabited. The turtle appears to be detrimentally affected by silt and sediment and less tolerant of other habitat degradation than most other aquatic turtle species within the range.

LIFE HISTORY AND ECOLOGY. The flattened musk turtle is a bottom-dweller and apparently fairly sedentary. The adults are active chiefly from dusk to mid-morning.

Basking occurs infrequently; one researcher has suggested that basking behavior is possibly an abnormal response to unfavorable conditions in the habitat or to poor health. Age at maturity is 4 to 6 years in males, at which age they are about 70 mm in carapace length. Females attain maturity in 6 to 8 years, carapace length 70-75 mm (David Close and Kenneth Dodd, pers. comm.).

Only one natural nest is known; it contained 2 eggs (K. Dodd, pers. comm.). On the basis of examination of female reproductive tracts, it has been determined that two clutches of eggs, averaging 3 each, are produced per season. The last clutch is laid from mid-June to late July or early August. Maximum egg number per season is 8 and average is 4.2 (David Close, pers. comm.). Hatching has been observed twice. Three hatchlings, after the carapace had fully expanded, ranged from 26.9 to 27.5 mm in length and 23.4 to 26 mm in width. Longevity is unknown, but under favorable conditions the turtles are believed capable of attaining a relatively old age, compared to other vertebrates.

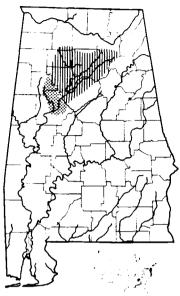
BASIS FOR STATUS CLASSIFICATION. The latest information available indicates a continuing decline in the populations of depressus over the majority of the range. In addition, the ratio of juveniles to adults seems to have undergone a substantial decrease within the past 10 to 20 years. Data suggest that depressus is strongly "k-selected," and thus more susceptible to many of the adversities caused by man's activities than other forms of life might be.

Although the factors responsible for the apparent declines are not known with certainty, excessive accumulations of silt and sediment, some of which are possibly toxic, are strongly implicated in the case of some habitats. Strip mining for coal occurs over most of the range, and abandoned, unreclaimed mined land is commonplace. Erosion during and following mining operations and drainage from old mines are believed to be important contributors to the problem, as are some activities associated with construction, forestry, and agriculture.

Industrial and municipal pollution are believed to be detrimental and may have eliminated some populations, and commercial collecting has recently emerged as a cause for concern. The 1984 Alabama Legislature recognized the threat of the latter to the turtle and enacted protective legislation. A "grandfather clause" exempting animals collected prior to enactment, and their progeny, however, makes the provisions difficult to enforce.

Considering the past degradation of the turtle's habitats, the threats the animal is facing, and the small geographic range it occupies, threatened status is warranted.

RECOMMENDATIONS. Existing regulations relative to water quality of streams within the turtle's range, as published by the Alabama Water Improvement Commission (now "Alabama Department of Environmental Management"), should be enforced, and, if necessary, strengthened to alleviate the degraded conditions that now prevail in many of the streams within the range. The aforementioned "grandfather clause" that permits continuing commercial trade in flattened musk turtles should be eliminated by legislative amendment. Because of the animal's depleted status and the numerous, continuing threats to its populations and habitat, THE FLATTENED MUSK TURTLE HAS BEEN PROPOSED



Range of the flattened musk turtle is shaded. Stippling indicates a zone of intergradation with the stripe-necked musk turtle. Sternotherus minor pel-

FOR LISTING AS A THREATENED SPECIES BY THE UNITED STATES DEPARTMENT OF THE INTERIOR (Nov. 1, 1985).

SELECTED REFERENCES

ESTRIDGE, R. E. 1970. The Taxonomic Status of Sternothaerus depressus (Testudinata. Kinosternidae) with Observations on its Ecology. M.S. thesis, Auburn University. 49 pp.

IVERSON, J. B. 1977. Sternotherus depressus. Cat. Amer. Amphib. Rept. 194:1-2.

MOUNT, R. H. 1981. The Status of the Flattened Musk Turtle, Sternotherus minor depressus. Unpub. Rept. to U.S. Fish and Wildl. Serv. 119 pp.

TINKLE, D. W. 1958. The Systematics and Ecology of the Sternothaerus carinatus Complex (Testudinata, Chelydridae). Tulane Stud. Zool. 6(1):1-56.

and R.G. Webb. 1955. A New Species of Sternotherus with a Discussion of the Sternotherus carinatus Complex. (Chelonia: Kinosternidae). Tulane Stud. Zool. 3(3):52-67.

PREPARED BY: Robert H. Mount, Department of Zoology-Entomology, Auburn University, Alabama 36849.

Threatened

GOPHER TORTOISE

Gopherus polyphemus (Daudin) Family Testudinidae Order Testudines

OTHER NAME. Gopher.

DESCRIPTION. The gopher tortoise is a medium large-sized turtle and the largest of our land turtles. Somens have been reported up to 34.5 cm (13.6 inche length. Large specimens of about 30.5 cm (12 inches) are uncommon. The front limbs and toenails flattened and bradapted for digging. The upper shell of adults is brothatchlings and young have yellow-centered scutes. The parts of young are yellowish and become dark brown a turtle matures.



FIG. 34. Gopher tortoise (Dan W. Speake).

RANGE. Populations occur in suitable habitats through Florida. The range extends northward to extreme sour South Carolina and westward in the Coastal Plain the Georgia, across southern Alabama and Mississippi, and southeastern Louisiana. Within this range the distribut spotty. In Alabama the species is fairly common in sandigions of the Lower Coastal Plain. Northward, gophers are countered much less frequently. The upper limit of the is approximately the lower boundary of the Black Belt or

HABITAT. Dry, sandy, or gravelly soils seem to be quirement of this species. A recent study in Georgia I that all colonies were restricted to areas with deep sandy supporting natural or altered sandhill vegetation. Most tions were in longleaf pine-scrub oak habitats, planted stands that were sufficiently open for low-growing herbac vegetation to be abundant, and in openings within these litats.

LIFE HISTORY AND ECOLOGY. Various speci grasses are the staple foods of gopher tortoises. Other is such as wild legumes, are used extensively when avail Fleshy fruits are eaten in season. Occasionally gophers been observed feeding on bones, droppings of other ani and even carrion.

Research in southern Georgia has shown that matin curs from April through early June. Nesting activity a

during the first 2 weeks in June and clutch size ranges from 4 to 12, which is very low in comparison to most of our other native turtles. Females are successful in producing young on the average of only once in about 10 years, chiefly as a result of the high rate of nest predation, averaging about 87 percent. For the first few years of life, juveniles are also vulnerable to predators. The tortoise grows slowly and, in Georgia and probably in Alahama, attainment of sexual maturity requires 16 to 21 years.

The gopher tortoise burrow is used not only by the tortoise but by some 30 other species of vertebrates and numerous invertebrates. Some of the latter are found nowhere else. The burrow of an adult gopher may extend from 1.8 m (6 feet) to o 12 m (39 feet) in length. However, few are longer than 10 i eet). Its cross-sectional dimensions vary with the animal size. The depth may be from 1.5 m (5 feet) to 2.7 m (9 feet) or more, depending on soil depth and moisture. It is believed that animal biomass in the sandhill habitat is greatly increased by the presence of tortoise burrows. This habitat frequently has little cover and is subject to extremes of heat and cold. Research showed that indigo snake population density varied with the number of tortoise burrows on a study area. Relationships among the inhabitants of gopher burrows remain poorly understood.

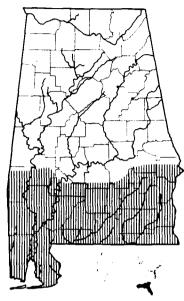
BASIS FOR STATUS CLASSIFICATION. Conservationists have been concerned over declining gopher tortoise populations for several years. The rapid loss and alteration of sandhill habitat, the most important type, has been pointed out by numerous biologists, and the tortoise population decline documented as well. The gopher tortoise has a low reproductive potential and a low rate of reproductive success. It is slow to mature. The gopher is also widely exploited for food by people. The tortoise population can be severely affected by habitat changes; for example total fire exclusion brings about declining populations. In 1981, concern over the decline of the gopher in Alabama resulted in a conservation regulation designating the gopher tortoise a game animal and declaring, "there is no open season during which the gopher tortoise may be lawfully hunted, taken, caught, captured, or

COMMENDATIONS. Forestry practices that maintain good habitat quality should be promoted. Trees should be widely spaced and burning should be practiced. Sandhill habitat sanctuaries should be established where possible. Control of the mammals that are serious predators on tortoise eggs (especially raccoons) would be desirable, either through hunting or trapping. Man's activities have improved habitat for small predators and have destroyed the larger predators that once controlled their numbers. The public should be educated about the species problems and the value of the gopher to the entire sandhill community.

SELECTED REFERENCES

AUFFENBERC, W. 1978. Gopher Tortoise (Daudin). Pages 33-35 in R. W. McDiarmid ed. Rare and Endangered Biota of Florida, Vol. 3: Amphibians and Reptiles. Univ. Presses of Fla., Gainesville.

FRANZ, R. AND W. AUFFENBERG. 1978. The Gopher Tortoise: A Declining Species. Pages 61-63 in R. Odom and L. Landers (eds). Proc. Rare End. Wildl. Symp., Ga. Dept. Nat. Resour., Game Fish Div. Tech. Bull. WLA.



Range of the gopher tortoise

LANDERS, J. L. AND W. A. MCRAE. 1980. Reproduction of the Gopher Tortoise (Copherus polyphemus) in Southwestern Georgia. Herpetologica 36(4):353-361.

, W. A. MCRAE, AND J. A. GARNER. 1982. Growth and Maturity of the Gopher Tortoise in Southwestern Georgia. Bull. Fla. Sta. Mus., Biol. Sci. 27(2):81-110.

MOUNT, R. H. 1975. The Reptiles and Amphibians of Alabama. Ala. Agr. Expt. Sta., Auburn. 347 pp.

PREPARED BY: Dan W. Speake, Alabama Cooperative Fish and Wildlife Research Unit, Auburn University. Alabama 36849.

Special Concern FLATWOODS SALAMANDER

Ambystoma cingulatum (Cope) Family Ambystomatidae Order Caudata

OTHER NAMES. None.

DESCRIPTION. A somewhat stocky salamander, up to about 15 cm (5 inches) long, with a relatively small head and fat tail. Entire body blackish with fine light gray or white lines on the back sides, forming a reticulum or netlike pattern: pattern fainter dorsally; venter with small, disconnected light specks. Small grooves below nostril on upper lip absent. Larva broad-headed, bushy gilled; belly white; each side

with a single, narrow yellow or white longitudinal stripe, passing through a chocolate brown dorsal ground color. The light brown face has a thin dark brown stripe passing through the eye from the nostril to the gills. No other broad-headed salamander larva has conspicuous lateral stripes.



FIG. 35. Flatwoods salamander (Ray E. Ashton, Jr.)

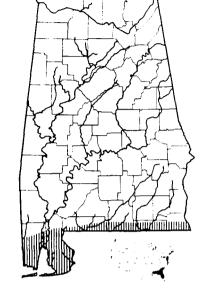
RANGE. Restricted to the southeastern U. S. Coastal Plain, from the southern half of South Carolina southward to Marion County in northern-central Florida, and westward at least to Mobile County, Alabama. In Alabama, the range is confined to the southernmost tier of counties (Mobile, Baldwin, Escambia, Covington, Geneva, and Houston), in the Lower Coastal Plain, although recent records are available only from Houston and Covington counties.

HABITAT. Pine flatwoods. Larvae are found in shallow cypress-gum ponds, flooded roadside ditches, and other such aquatic habitats in flatwoods. Adults live in the flatwoods surrounding breeding sites and may be dependent upon some microhabitat aspect of the wiregrass (Aristida stricta) - dominated groundcover for long-term survival.

LIFE HISTORY AND ECOLOGY. This species is one of only two members of its family that breed in the fall and lay eggs on land. Adults migrate to the breeding sites during rainy weather in October and November, before they fill with water, where they court. The females lay groups of 1-35 eggs (for a total of up to at least 225) at the bases of bushes, small trees, and clumps of grass, usually in the lowest parts of the depressions. Embryos begin developing immediately, but remain within the eggs until heavy rains fill the depressions, usually in December or January. Metamorphosis occurs in March and April. The post-larval life of the flatwoods salamander is totally unknown. Age at maturity, longevity, survivorship, and limiting factors are important aspects that need study.

BASIS FOR STATUS CLASSIFICATION. The entire range of this secretive species is small and few recent records are available from Alabama. Its pine flatwoods-wiregrass habitat is diminishing rapidly due to agriculture, silvicultural site preparation, and urban and suburban development. If the species is unable to survive in edificarian habitats, its prospects for long-term survival may be inversely related to the rate of disappearance of the natural groundcover of the low pine flatwoods habitat.

RECOMMENDATIONS. Not only should studies be undertaken to reveal important and possibly critical aspects of its life history and ecology, but a census of likely habitats in



Range of the flatwoods salamander

Alabama should be made and efforts should be undert determine the full extent of the Alabama range. In at land management practices that favor maintenance of pine flatwoods-wiregrass habitats should be encourar recommended to the extent that they are economicall ble. However, the impact of "prescribed" winter bur pine flatwoods, an artificial fire regime, should be gated, in as much as the salamander tends to be near taken during winter.

SELECTED REFERENCES

ANDERSON, J. D. AND G. K. WILLIAMSON. 1976. Ter Mode of Reproduction in Ambystoma cingulatura Herptologica 32(2):214-221.

MARTOF, R. S. 1968. Ambystoma cingulatum. Cat Amphib. Rept. 57.1-57.2.

MOUNT, R. H. 1975. The Reptiles and Amphibians bama. Ala. Agr. Expt. Sta., Auburn. 347 pp.

. 1980. Survey for the Presence or Abs Threatened or Endangered Reptiles and Amphibia necuh National Forest, Alabama. Unpub. Rept. t For. Serv. 108 pp.

PREPARED BY: D. Bruce Means, Coastal Plain tute, 1313 N. Duval St., Tallahassee, Florida 32303.

Birds vary widely with respect to their adaptability. The Common Crow, for example, is a "generalist" and can exploit a wide variety of food and habitat types. Such birds are better able to survive environmental changes. Conversely, a bird with restrictive ecological requirements is the Snowy Plover. It feeds only in the intertidal zone on remote offshore islands and does not tolerate human disturbance. This shorebird is a habitat specialist, sensitive to environmental alterations, and exemplary of a number that are prime candidates for extinction or extirpation.

Although disease, predation, and natural disasters can produce environmental changes capable of adversely affecting birds, habitat destruction and alteration by humans continue the greatest threats to the survival of Alabama birdlife Welv. Partial damage or even slight changes in the environment can cause immediate trouble for the habitat specialists. Adaptable species displaced because of habitat destruction or alteration may exploit nearby areas and compete with species that have more restrictive ecological requirements. Such population shifts may stress the habitats and ultimately affect their quality. Substantial increases in bird numbers often occur during the winter and summer, when migrants swell local populations. Resulting population pressures coupled with deterioration of habitat can jeopardize the survival of some species. "Quality habitat" throughout the year, for all stages of a bird's life cycle, is essential for the species well-being.

In addition to the recommendations contained in the "Preface" and those included in the species accounts, the Committee on Birds recommends the following for all species:

- 1. Compile existing data on the biology; on historic and current range limits, including wintering grounds, migrational routes, and stops; and on any other aspect that would aid in identifying local critical habitats.
- 2. Derive estimates of population densities on a seasonal basis to help determine the magnitude of ecological stress placed on the habitat.
- Determine the diseases, predators, and human-related s that affect the species well-being and assess the mage of their impacts.
- 4. Conduct habitat analyses and assess quality and quantity of habitat available.
- 5. Conduct environmental impact studies in the case of all proposed projects and changes in land use that could substantially affect the regional avifauna. The results could be used to preclude or to minimize adverse impacts that might occur otherwise and to enable us to exercise better stewardship of our land and water resources in general.

Dan C. Holliman

ALABAMA BIRDS NEEDING SPECIAL ATTENTION

Species

Bald Eagle

Current Protection

Wood Stork ENDANGERED
Federal (en

Federal (endangered status), State Federal (endangered status), State Sandhill Crane

Federal (endangered status)),

State

Snowy Plover Fi Red-cockaded Woodpecker Fi

Federal, State Federal, (endangered status),

State

Bachman's Warbler

Federal (endangered status), State

THREATENED

Golden Eagle Peregrine Falcon Bewick's Wren Federal, State Federal (endangered status), State Federal, State

SPECIAL CONCERN

American White Pelican Federal, State Reddish Egret Federal, State Mottled Duck Federal, State Osprey Federal, State Coper's Hawk Federal, State Merlin Federal, State Wilson's Plover Federal, State Federal, State

Piping Plover Federal (threatened status), State
American Ovstercatcher Federal, State

American Oystercatcher Fee Gull-billed Tern Fee Common Ground Dove Fee

Federal, State Federal, State

POORLY KNOWN

Yellow Rail	Federal, State
Black Rail	Federal, State
Long-eared Owl	Federal, State
Northern Saw-Whet Owl	Federal, State
Alder Flycatcher	Federal, State
Willow Flycatcher	Federal, State
Warbling Vireo	Federal, State
Henslow's Sparrow	Federal, State
Le Conte's Sparrow	Federal, State

This status designation applies to the Mississippi Sandhill Crane (see text)

Endangered wood stork

Mycteria americana Linnaeus Family Ciconiidae Order Ciconiiformes

OTHER NAMES. Wood Ibis, Flinthead.
DESCRIPTION. Wood Storks are large, long-legged birds with long, heavy bills. Head and upper neck lack feathers in



FIG. 62. Wood Storks (Julian L. Dusi).

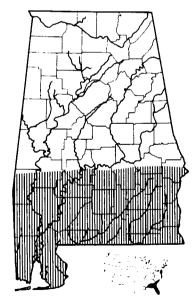
the adult; the exposed skin gray-colored; body feathers white. Flight feathers and some coverts black with a bluegreen sheen. Total length, 84-108 cm (35-45 inches) wingspread, to 167 cm (66 inches). Size about that of the Great Blue Heron but with a heavier body.

RANGE. Originally bred in all of the Gulf Coast States and ranged into Central and South America. In the United States, it presently breeds in Florida, southeastern Georgia, and South Carolina, and disperses into Alabama and other states following breeding.

HABITAT. Wood Storks are wetland birds. They nest in tall cypress trees in swamps. Falling water levels in swamps, resulting in concentrations of fish, are important to their feeding.

HISTORY AND ECOLOGY: Colonial nesters, Wood Storks begin nesting in the northern portion of the range from February to April, with most of the young leaving the nests in June. After leaving they disperse throughout the Gulf States and up the Atlantic coast to Maryland, with some individuals going beyond.

They feed on small fishes that concentrate in shallow water by immersing the open bill and seizing any fish that touches it. They often soar and may travel long distances to feeding sites.



Range of the Wood Stork. Shaded area in Alabama is that in which the species is most likely to be sighted.

BASIS FOR STATUS CLASSIFICATION. Although the Wood Stork once nested in Alabama, it no longer does so. In Florida, the species' breeding is detrimentally affected by practices that interfere with normal fluctuation in surface water levels. It is believed that some losses result from shoot-

ing. THE WOOD STORK IS LISTED AS ENDANGER BY THE UNITED STATES DEPARTMENT OF THE TERIOR.

RECOMMENDATIONS. Monitor potential breeding in Alabama for possible breeding and monitor the populat that disperse into Alabama. Support Wood Stork man ment in Florida. Education to reduce shooting deaths of storks and to reduce disturbance of the storks at possibility is a possible to the storks at possibility of the storks at possi

SELECTED REFERENCES

BENT, A. C. 1927. Life Histories of North American M Birds, U. S. Natl. Mus. Bull. 135, 490 pp.

DUSI, J. L. AND DUSI, R. T. 1968. Evidence for the Bree of the Wood Stock in Alabama. Ala. Birdlife 16:14-16. IMHOF, T. A. 1976. Alabama Birds, Second Ed. Univ. of Press, Tuscaloosa. 445 pp.

PALMER, R. S. (Ed.). 1962. Handbook of North Amer Birds Vol. I. Yale Univ. Press, New Haven and Lon 567 pp.

PREPARED BY: Julian L. Dusi, Department of Zool Entomology, Auburn University, Alabama 36849.

Endangered BALD EAGLE

Haliaeetus leucocephalus (Linnaeus) Accipitridae Falconiformes

OTHER NAMES, None,

DESCRIPTION. An extremely large bird, 71.0-81. (28-32 inches) in length with a wingspread of 183-214 or 7 feet). Adults uniformly dark brown except for white I



FIG. 63. Bald Eagle (Bill Byrne, Massachusetts Div. Fish and Wile

The Snowy Plover requires undisturbed, sandy beaches and, more so than most other creatures, its numbers are greater on islands. The Piping and Snowy plovers appear to be complementary sister species. The more cosmopolitan Snowy Plover is replaced in the northeast by the Piping Plover, which winters with it on the Gulf Coast where there appears to be no competition.

BASIS FOR STATUS CLASSIFICATION. In recent decades, the Snowy Plover's critical beaches have been subjected to excessive human activity. Some human recreation is not detrimental, but when a great many people take part or when the activity includes vehicles, the beach as a habitat for wild activity includes and animal, suffers.

bpment of beaches is an even more serious threat because it is permanent. The building of houses, apartments, and other structures on the beach has become excessive.

RECOMMENDATIONS. Although legislation exists to limit the use of off-road vehicles, it is often violated and should be more vigorously enforced. The few remaining relatively pristine beaches in Alabama should be kept as natural as possible. Recreational use of beaches should be regulated to the extent practicable to avoid unnecessary disturbance of the fragile habitat. The public should constantly be reminded that the plant and animal life associated with the coast are important in making it attractive.

Ideally, no human intrusion at all is best for the Snowy Plover, especially during breeding. If possible, Sand and Pelican islands, the western portion of Dauphin Island, Fort Morgan, and some part of the Alabama Point area should be set aside as sanctuaries.



Range of the Snowy Plover.

SELECTED REFERENCES

AMERICAN BIRDS, 1971-1983 (Audubon Field Notes, 1947-1970, Vols. 1-24) Vols. 25-37 Bi-Monthly, National Audubon Society, New York; four issues contain season reports, one the Christmas Count, all of which contain distributional data on the Snowy Ployer.

CHAPMAN, F. M. 1966. Handbook of Birds of Eastern North America. Dover, N.Y. 581 pp.

HARRISON, C. 1978. A Field Guide to the Nests, Eggs, and Nestlings of North American Birds. Collins. Glasgow. 416 pp.

IMHOF, T. A. 1976. Alabama Birds, Second Ed. Univ. Ala. Press, Tuscaloosa. 445 pp.

PREPARED BY: Thomas A. Imhof, 1036 Pike Road, Birmingham, Alabama 35218.

Endangered RED-COCKADED WOODPECKER

Picoides borealis (Vieillot)
Family Picidae
Order Piciformes

OTHER NAMES. None.

DESCRIPTION. The Red-cockaded Woodpecker is about the size of the Hairy Woodpecker, which it resembles except it has a zebra-like back, a black crown and a large white cheek patch. Male birds have a small red spot near the ear; otherwise the sexes are similar. Length 20 cm (8½ inches).



FIG. 66. Red-cockaded Woodpecker (Ed Tyberghein).

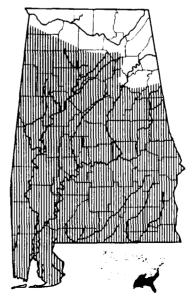
RANGE. This woodpecker is resident from eastern Oklahoma, Kentucky, and southern Maryland south to eastern Texas and southern Florida. In Alabama, it is found locally in most of the State south of the Tennessee River.

HABITAT. Red-cockaded Woodpeckers reside in open pine woods. Requirements include living mature pines hav-

ing dead hearts, within which the birds excavate their nest cavities. Optimal habitat has, in addition, interspersed stands of young pines, which provide good sites for foraging.

LIFE HISTORY AND ECOLOGY. Red-cockaded woodpeckers travel through open pine woods in small bands searching limbs, twigs, and cones for the insects that comprise the main portion of their food. Some seeds are also eaten. This species invariably nests in the aforementioned mature pines. The nest hole is dug into the center of the tree and angles upward until the dead heartwood is reached. The bird then digs straight down for about 30 cm (1 foot). Small holes are pecked above and below the nest entrance, allowing sap to flow and cover the surface around the hole and downward for about 1 m or so. The sticky surface apparently tends to repel such predators as snakes and flying squirrels. Two to 6 glossy white eggs are laid in the cavity. Old cavities are used for roosting.

BASIS FOR STATUS CLASSIFICATION. The culling of "substandard" trees and the increasingly extensive areas devoted to short-rotation forestry have greatly reduced Redcockaded Woodpecker populations. Large pine trees with dead hearts are undesirable in the view of commercial foresters, and many have been removed. Many forest managers, knowing the endangered status of this species, now leave the nesting trees as well as a few large trees that surround them. At the present time, the extent of the area that should be left alone to enable a nesting colony to survive indefinitely is unknown. It has been estimated, however, that the home range size may approach 80 ha (200 acres). THE SPECIES IS CONSIDERED ENDANGERED BY THE UNITED STATES DEPARTMENT OF THE INTERIOR.



age of the Red-cackaded Woodnecker.

RECOMMENDATIONS. Life history and habitat studies on the Red-cockaded Woodpecker are underway throughout the range. These studies are being coordinated through the Endangered Species Office of the U. S. Fish and Wildlife Service. Until concrete information is available on the species' requirements, little can be done to assure that the population can be brought out of danger. All corporate and individual owners of large tracts of forestland should be kept informed of current research and encouraged to set aside a few acres of trees surrounding. Red-cockaded Woodpecker nesting sites.

SELECTED REFERENCES

IMHOF, T. A. 1976. Alabama Birds. Second Ed., Univ. of Ala. Press, Tuscaloosa. 445 pp.

ROBBINS, C. S., B. BRUUN, AND H. S. ZIM. 1966. Birds of North America. Golden Press, N.Y.

U. S. FISH AND WILDLIFE SERVICE. 1976. Red-cockaded Woodpecker Recovery Plan. U.S. Fish and Wildl. Serv., Washington, D.C.

PREPARED BY: James E. Keeler, 3576 N. Georgetown Dr., Montgomery, Alabama 36109

Endangered

BACHMAN'S WARBLER

Vermivora bachmani (Audubon) Family Emberizidae Order Passeriformes

OTHER NAMES. None.

DESCRIPTION. Length: 11.5 cm (4.5 inches). Adult males with yellow forehead and chin and black cap and throat, or bib. Amount of black in the cap and throat parts varies. Upper parts olive-green and under parts yellow except for white undertail coverts. Adult females with yellow forehead, gray crown and cheeks, and prominent yellow eye ring. Breast buff-colored or only slightly yellowish. Both adult males and females have noticeable yellow shoulder patch, not always stressed in field guides, which may be a useful field mark. Immatures buff below, brown above, and have whitish eye ring.

RANGE. Breeding has been recorded only in Alabama. Arkansas, Kentucky. Missouri, and South Carolina. The species has also been recorded in Florida, Georgia, Indiana. Louisiana, Mississippi. North Carolina. Oklahoma. and Virginia. The winter range is Cuba, including the Isle of Pines The present distribution is unknown, and no populations are known.

HABITAT. Bachman's Warbler frequents, or formerly frequented, mature hardwood bottoms and headwater swamp where openings permit the development of second growth vegetation. Apparently it does not inhabit swamps that as subject to flooding for extended periods of time. From descriptions of 32 nesting habitats in the southern Coastal Plair reported between 1897 and 1919, the plant communities used for nesting were sweet bay-swamp tupelo-red maple associ

APPENDIXB



DRAFT RCRA FACILITY ASSESSMENT REPORT

KAY-FRIES, INCORPORATED SITE THEODORE, ALABAMA

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY Office of Waste Programs Enforcement Washington, D.C. 20460

Work Assignment No.

: R04019

EPA Region

: IV

Site No.

Prepared by

: ALD000608224

Contract No.

: 68-W9-0004

CDM Federal Programs

: TES7-R04019-DR-BZDL-2 : A.T. Kearney

Corporation Document No.

Work Assignment Project Manager : Tony Isolda Telephone Number

: (404) 952-7393 : Doyle Brittain

Primary Contact Telephone Number

: (404) 347-7603

Date Prepared

: November 1, 1990

TABLE OF CONTENTS

			Page
ı.	Executive Sur	mmary	I-1
II.	Introduction		II-1
	Facility D Waste Mana Regulatory	h and VSI	II-3 II-4 II-8 II-20 II-24
III.		of Solid Waste nits and Areas of Concern	III-1
ıv.	Summary List	s	IV-1
v.	Suggested Sa	mpling Strategies	V-1
VI.	References .		VI-1
	APPENDIX A	Photographic Log	
	APPENDIX B	VSI Logbook	
	APPENDIX C	SWMU Location Map	
	APPENDIX D	Chemical Analyses From Wastewater Treatment Units	
	APPENDIX D-1	Summary of Analysis Results for Soil, Sludge, Basin Liquids and Liquids Between Impoundment Liners and Basin Underdrain System, Equalization and Aeration Basins	
	APPENDIX D-2	Analysis of Aeration Basin Sludge	
	APPENDIX E	Analyses of Groundwater Contamination Indicator Parameters	
	APPENDIX F	Characteristics of Soils at Kay-Fries Theodore, Alabama	

List of Figures

	Page	
II-1	Topographic Map Showing Location of Kay-Fries II-5 Facility	
II - 2	Topographic Map of Kay-Fries Facility, II-7 Showing how Regrading Altered Topography of Site	
I I- 3	Schematic Diagram of Orthoester Process,II-10 including 1981-1986 Waste Management System	
II - 4	Schematic Diagram of Orthoester	
II - 5	Schematic Diagram of HMDS Process,	
II-6	Schematic Diagram of Former Hazardous	
II - 7	Schematic Diagram of Wastewater	
II - 8	Physiographic Divisions of Southwestern II-25 Alabama, Showing Kay-Fries Location	
II-9	Wind Rose for Mobile, Alabama	
II-10	Soil Map in Vicinity of Kay-Fries	
II-11	Map Showing Regional Geologic	
II-12	Lithologic and Hydrologic Characteristics ofII-33 Stratigraphic Units of Interest	
II-13	Aquifer Recharge Areas in Vicininty of II-35 Kay-Fries	
II-14	Schematic Cross Section at Kay-Fries FacilityII-37	
II - 15	Potentiometric Map at Kay-Fries	
II - 16	Location Map of Monitoring Well System	

List of Figures (Con't.)

		Page
III-1	Location of Storm/Process Sewer System	III-7
III-2	Schematic Diagram of the Neutralization Tank (SWMU No. 13)	III-26
III-3	Location of Runoff System	III-50

List of Tables

		Page
Table I-1	Summary of SWMUs and AOCs	I-4
Table II-1	Anticipated Chemicals and Concentrations in a Major Spill	II-9
Table II-2	Analysis of Caustic Wastewater	II-11
Table II-3	Parameters in Monitoring Wells	II-40

I. EXECUTIVE SUMMARY

This RCRA Facility Assessment (RFA) is based on a Preliminary Review (PR) of U.S. EPA Region IV and Alabama Department of Environmental Management (ADEM) files and a Visual Site Inspection (VSI). The PR was conducted in July 1990, with the VSI conducted on July 30, 1990. The purpose of the RFA is to identify Solid Waste Management Units (SWMUs) located at the facility, and to evaluate their potential for release of hazardous constituents to air, surface water, soil, and groundwater. Areas of Concern (AOCs), which may be potential sources of environmental contamination not necessarily involving wastes, are also identified.

Kay-Fries, Alabama, Inc. is located on a 160-acre tract of land in the Theodore Industrial Park three miles southeast of Theodore, Alabama. The facility manufactures organic chemical intermediates for the pharmaceutical and chemical industries, and has been in operation since 1981.

During the past 10 years, Kay-Fries has undertaken several process and administrative changes which have impacted the status of several units on-site. Briefly those changes consist of the following:

- Neutralization of process wastewaters in the process area to eliminate the corrosive wastestream (D002) from entering the Wastewater Treatment System (SWMU Nos. 1-8);
- 2. Elimination of the Former Sludge Settling Tank and Sludge Filter Press (SWMU Nos. 9 and 10, respectively) from the Wastewater Treatment System after a short period of operation;
- 3. Elimination of liquid waste alcohol (D001) from the wastestream going to the Former Hazardous Waste Incinerator System (SWMU Nos. 19-21), with the accompanying installation of the Hazardous Waste Tank (SWMU No. 15) as a less-than-90-day storage unit.
- 4. Elimination of the need for a Hazardous Waste Container Storage Area (SWMU No. 16), due to cessation of corrosive sludge formation in the Wastewater Treatment Basins (SWMU Nos. 5 and 7) with a new neutralized wastestream. The Container Storage Area is now used as a less-than-90-day storage unit.

Corrosive process wastewaters were the primary waste at the facility. The acidic wastewaters were neutralized until 1986 in the wastewater treatment system, which consists of two large

impoundments (SWMU Nos. 5 and 7) with associated sumps (SWMU Nos. 4 and 6) and tanks (SWMU Nos. 8 and 9). The impoundments were interim status units based on the corrosive wastewater managed by the units. In 1986, an Elementary Neutralization System (SWMU Nos. 11 - 13) in the process area of the facility replaced the Wastewater Mix Basin (SWMU No. 6) in the Wastewater Treatment System as the unit where the pH of wastewater is neutralized. This rendered the influent to the Wastewater Treatment System as non-corrosive. The facility is pursuing clean closure of the impoundments as RCRA-regulated units, although the system is still in operation. Shallow ground-water contamination with diethylbenzene, (DEB), a non-Appendix VIII and IX constituent, has been detected downgradient from the impoundments. Vapors from the orthoester process area distillation columns are sent to the Former Hazardous Waste Incinerator System (SWMU Nos. 19 - 21) for thermal destruction, in the Incinerator (SWMU No. 19). Liquid waste alcohol (D001) was used as a fuel in the Waste Heat Boiler (SWMU No. 20). Since 1986, the system no longer manages hazardous waste. The Incinerator operates under an air permit, instead of a RCRA permit, and the Waste Heat Boiler burns only natural gas to provide steam for plant operations. The waste alcohol is currently stored less than 90 days in the Hazardous Waste Tank (SWMU NO. 15).

Flammable (D001) and corrosive (D002) solid wastes were stored from 1980 to 1986 at the Container Storage Area (SWMU No. 16).

With the elimination of acidic wastewaters in the wastewater treatment system in 1986 by the installation of the Elementary Neutralization System (SWMU Nos. 11 - 13), the unit ceased to store corrosive waste. The storage area was clean closed as an interim status unit in 1986. It is currently used for less-than-90-day storage of flammable (D001) solids.

The PR and VSI resulted in the identification of twenty-five (25) SWMUs and one (1) AOC. The locations of all SWMUs and AOCs found are shown on the SWMU location map in Appendix A.

Twenty-two (22) of the SWMUs were deemed to require no further action. It is suggested that RFA Phase II sampling be conducted at three SWMUs and the one AOC which are suspected of currently managing hazardous wastes or constituents, and which have the potential for releases to the environment. These units are the Equalization Basin (SWMU No. 5), the Aeration Basin (SWMU No. 7), the Drum Rinse Unit (SWMU No. 21), and the Runoff Ditch System (AOC A). A RCRA Facility Investigation (RFI) is not required for any units. Integrity testing by the facility is recommended for the Storm/Process Sewer System (SWMU No. 3) and the Lift Sump (SWMU No. 4). Cleanup of the Former Sludge Setting Tank and Former Sludge Filter Press (SWMU Nos. 9 and 10, respectively) is also recommended.

A summary of key information on the SWMUs is presented in Table I-1.

TABLE 1-1 SUMMARY OF SUMUS AND ACCS

SLIMU/AOC	Type of Unit	Years of Operation	Waste Managed	Pollutant Migration Pathways (GM, SW,S,A,SSG)	Evidence of Release	Exposure ² Potential	Need for Interim Measures	RFI	No Further Action	Further Action
1. Process Area Floor Trenches	Wastewater Transfer	1981 to Present	Process Spills/ Wastewater	A,SW,S, GW,SSG	No	L	٠	•	x	-
2. Reil Loading/ Unloading Area with Floor Trench	Wastewater/ Spill Collection	1981 to Present	Product Spills/ Wastewater	A,SW,S, GW,SSG	No	L	•	٠	x	•
3. Storm/Process Sewer System	Wastewater Transfer	1981 to Present	Wastewater/ Spills	s	No	L-M	•			x'
4. Lift Sump	Wastewater Collection	1981 to Present	Wastewater/ Spills	s, GW, SSG	No	U	•	-		x'
5. Equalization Basin	Surface Impoundment	1981 to Present	Wastewater/ Spills	A,S	Yes	L-M	•	•		Хэ
6. Wastewater Mix Basin	Wastewater Treatment	1981 to Present	Wastewater	A,SW,S, GW,SSG	No	L	•		x	-
7. Aeration Basin	Surface Impoundment	1981 to Present	Wastewater	A	Yes	М	-	•		x³
8. Clarifier	Wastewater Treatment	1981 to Present	Wastewater	A,SV,S GW,SSG	No	L	-	•	x	
9. Former Sludge Settling Tank	Wastewater Treatment	1981	Wastewater/ Sludge	A,SU,S, GW,SSG	No	L	•	-	-	x*
10. Former Sludge Filter Press	Wastewater Treatment	1981	Wastewater/ Sludge	s	No	ι	-	•		X ⁶
11, Elementary 12. Neutralization 13. System	Wastewater Treatment	1986 to Present	Process Vastewater	A,SW,S, GW, SSG	No	L	•	•	x	-
14. Cyad Wastewater Tank	Storage Tank	1986 to Present	Process Wastewater	A,SW,S, GW,SSG	No	L			x	
15. Hazardous Waste Tank	Storage Tank	1990 to Present	Process Wastewater	A,SW,S GW,SSG	No	L	-	-	x	
16. Container Storage Area	Container Storage	1980 to Present	D001,D002 Wastes	A,SW,S, GW,SSG	No	L	•	- [x	-

TABLE 1-1 SUMMARY OF SUMUS AND ACCS

S\MU/AOC	Type of Unit	Years of Operation	Waste Managed	Pollutant Migration Pathways (GW, SW,S,A,SSG)	Evidence of Release	Exposure ² Potential	Need for Interim Heasures	RFI	No Further Action	Further Action
17. Former Equalization Basin Sludge/Liner Storage Site	Container Storage	1983	D002 Studge, PVC Liner	A,SW,S, GW,SSG	No	N	-	-	X ⁴	-
18. Venturi Scrubber	Air Pollution Control	1980 to Present	0001 Vapors	A,SW,S, GW,SSG	No	ι	•		X ⁶	•
19. Incinerator 20. Waste Heat Boiler 21. Caustic Scrubber	Incinerator	1981 to Present	D001 Vapors and Liquids	A,SW,S, GW,SSG	No	L	-	•	Χ¢	•
22. Drum Rinse Unit	Open Tank	1990 to Present	Waste Product/ Raw Material	A,SW,S, GW, SSG	No	L	_	-	-	X³
23. Former Studge Disposal Site	Landfill	1983 to 1986	D002 Sludge, PVC Liner	A,SW,S, GW,SSG	No	L	•	·	×	-
24. Former Construction Debris Disposal Site	Landfill	1983 to 1986	Construction Debris	A,SW,S, GW,SSG	No	t	-	-	×	·
25. Former Cyanide Stripper Column Site	Wastewater Treatment	1981 to 1986	Cyanide, Ammonia, Muriatic Acid	s	Yes	L ·	-	-	X*	-
AOC Runoff Ditch A System	Stormwater Transfer	1981 to Present	Spills	A,S,GW,SSG	No	L-N ^a	-	-	•	Xa

¹ A designates air; S designates soil; SW designates surface water; GW designates groundwater; SSG designates subsurface gas.

N designates no; L designates a low; M designates a moderate; M designates a high; and U designates an unknown release/generation potential. See SUMU description for substantiation.

³ RFA Phase [] sampling suggested.

⁴ Determine exact unit location.

⁵ Air emissions are regulated by ADEM and Mobile County Board of Health.

 $^{^{}ullet}$ Moderate release/generation potential exists when spills or overtopping occur.

⁷ Integrity testing by the facility is recommended.

^{*} Cleanup of this inactive unit is recommended.

^{*} Releases from the unit would have been managed by the Process Area Floor Trenches (SMMU No. 1).

II. INTRODUCTION

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) authorized EPA to require corrective action for releases of hazardous wastes and/or hazardous constituents from Solid Waste Management Units (SWMUs) and other Areas of Concern (AOCs) at all operating, closed, or closing RCRA facilities. The intention of this authority is to address previously unregulated releases to air, surface water, soil, and groundwater. The first phase of the corrective action program, as established by EPA, is a RCRA Facility Assessment (RFA). The RFA includes a Preliminary Review of all available relevant documents, a Visual Site Inspection (VSI), and if appropriate, a Sampling Visit (SV). This report summarizes the results of the file review conducted in July 1990 and the VSI conducted on July 30, 1990. A total of 25 SWMUs and one AOC were identified as a result of the PR and VSI.

The Kay-Fries facility was built by Brown and Root in 1980, and began operating in 1981 as a manufacturer of organic chemical intermediates for the chemical and pharmaceutical industries. Products consist primarily of orthoesters and organo-functional silanes.

There is documented shallow groundwater contamination containing diethylbenzene (DEB), a constituent not listed in Appendix VIII or

IX, downgradient from the Equalization and Aeration Basins (SWMU Nos. 5 and 7). Concentrations of DEB range up to 379 ppb. In the only analysis of the groundwater for drinking water parameters in 1983 and 1984, cadmium contamination was detected up to 0.065 mg/l in downgradient wells which had turbid samples. The sampling was for total, not dissolved, metals. Cadmium was the only primary Drinking Water Standard (DWS) which was exceeded. Manganese, iron, and phenols (secondary DWS parameters) were also detected (Reference 25).

This chapter summarizes the file search and VSI, and provides additional information about the history, process descriptions, waste management practices, environment, and demographic setting of The SWMUs and AOC are described in Chapter III. the facility. Summary tables of the units requiring further action are presented in Chapter IV. Chapter V provides a suggested sampling strategy for those units requiring Phase II sampling. The references used in this report are listed in Chapter VI. Appendix A contains the Photographic Log documenting the physical condition of the SWMUs and AOC during the VSI, while Appendix B contains the VSI log. Appendix C provides a facility map showing the approximate location of all SWMUs and AOCs identified in the PR and VSI. Appendix D contains chemical analyses from wastewater treatment units, including soil, sludge and liquid samples from the Equalization and Aeration Basins (SWMU Nos. 5 and 7). Appendix E contains groundwater data from the monitoring system for groundwater contamination indicators (pH, specific conductance, TOC, and TOX). Appendix F contains more detail on the soils found at the Kay-Fries facility.

File Search and VSI

This RFA report is based on a review of file material available at EPA Region IV and Alabama Department of Environmental Management (ADEM) offices, and observations made during the VSI. The file review was conducted during July 1990, and included a review of RCRA, Air and Water files. The VSI was conducted on July 30, 1990 at the Kay-Fries facility near Theodore, Alabama.

The Kearney VSI team was accompanied by EPA Region IV and ADEM representatives. The Kearney team arrived at the facility at 10:00 AM, due to flight delays enroute. The VSI kickoff meeting began immediately. Attendees at the meeting were:

J. Carloss A.T. Kearney

J. Dreith A.T. Kearney

T. Tobin-Uhlmeyer EPA Region IV (compliance)

D. Beatty-Carmack ADEM

M. Behel ADEM

L. Patrick Kay-Fries, Hüls-America

During the meeting the incinerator system and hazardous waste storage were briefly discussed. The facility tour began at 10:15 a.m. Skies were hazy and the temperature was approximately 85°

Farenheit (°F). The team viewed the Wastewater Treatment System (SWMU Nos. 1-10), the Runoff Ditch System (AOC A), and the Former Hazardous Waste Incinerator System (SWMU Nos. 19-21). Orthoester process area, the team viewed the Elementary Neutralization System (SWMU Nos. 11-13), and the Former Cyanide Stripper Column site (SWMU No. 24). Near the Silanes Process area, the team then examined the Hazardous Waste Tank (SWMU No. 15) and the Drum Rinse Unit (SWMU No. 22). The Rail Loading/Unloading Area (SWMU No. 2) and the Container Storage Area (SWMU No. 16) were viewed The team viewed the Former Sludge Disposal Site (SWMU No. 23) for a distance, as earthmoving operations were in progress for the new isophorone derivatives facility. The team viewed the Cyad Wastewater Tank (SWMU No. 14), and completed the facility tour by viewing the Venturi Scrubber (SWMU No. 18) and the Caustic Scrubber (SWMU No. 21) near the Orthoester Process Area. The temperature at the end of the tour was approximately 95°F, with hazy conditions persisting. The close-out meeting was held with Lee Patrick at Specific dates of operation and unit capacities were discussed, along with an update on the current operation of the orthoester process area. The Kearney team left the facility at 12:15.

Facility Description

Kay-Fries, Alabama, Inc. is located on a 160-acre tract of land in Theodore Industrial Park In Theodore, Alabama (Figure II-1). This

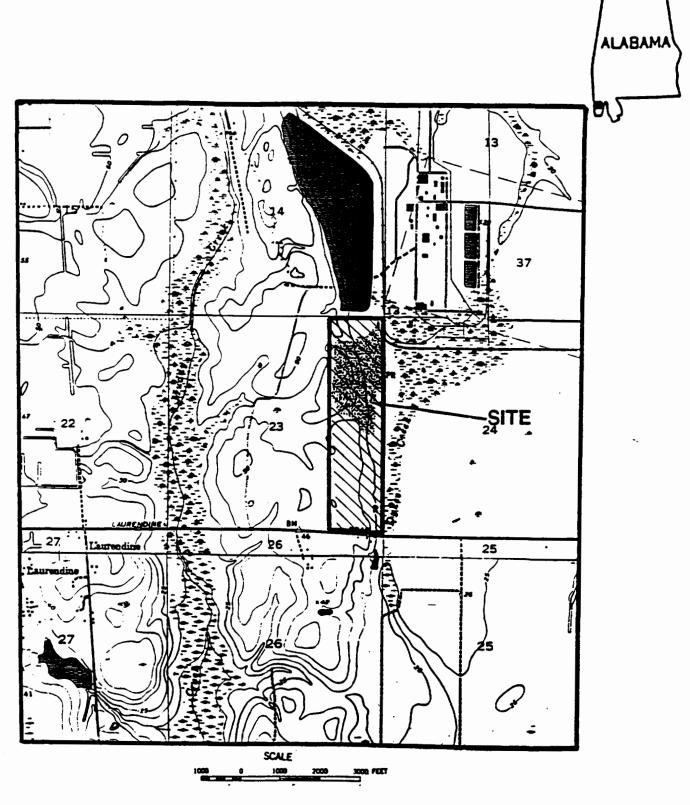


Figure II-1. Topographic Map Showing Location of Kay-Fries Facility (Reference 160).

site is located 17 miles south of Mobile, Alabama. The facility coordinates are 30° 30'30" North, and 88° 08' 30" West (Reference 3).

The facility was originally built in 1980 and was initially operated by Brown and Root in 1981. Prior to construction of the chemical facility, the area was undeveloped coastal lowlands. When the facility was built, the site was regraded to the topography shown in Figure II-2 to eliminate the swampy area in the northeast corner of the facility. Kay-Fries, Inc., a subsidiary of Dynamit Nobel of America, Inc., purchased the facility in 1982. The ownership of Kay-Fries changed again in 1988, when Dynamit Nobel was purchased by Hüls America, Inc., a German-based corporation.

Kay Fries, Inc. manufactures organic chemical intermediates which typically include orthoesters and organo-functional silanes. These products are not marketed directly to the consumer, but are made by batch processes for the chemical and pharmaceutical industries. Major feedstocks include methanol, ethanol, acetonitrile, cyanide, silicon tetrachloride, trichlorosilane and other silanes, and hydrochloric acid (Reference 26). Hazardous wastes generated from the process activities include corrosive (D002) and ignitable (D001) wastes.

When the plant began operations in 1981, it produced a variety of organo-functional silanes, including vinyl trimethoxyethoxy silane,

iso-butyl trimethoxy silane, chloropropyl trimethoxy silane, and methyl trimethoxy silane (Reference 2). The facility also produced orthoesters and orthoformates. Chemicals and their maximum weight-percent concentrations which could be found in the wastewater are shown in Table II-1 (References 1, 63).

Waste Management Practices

A caustic wash solution, designated as Waste #1 in the January 1986 Revised Part B, was produced in the orthoester process area. Orthoesters are produced using diethylbenzene (DEB), alcohol, acetonitrile or hydrogen cyanide, and hydrogen chloride as raw materials. The reaction produces orthoester, unreacted raw materials, by-product ammonium chloride, and small amounts of alkyl chloride and ester. After the reaction, the ammonium chloride is removed by centrifuge. The remaining liquid is washed with a caustic solution to phase-separate the organics from the water. The organics are distilled for product recovery.

Waste management practices in the orthoester process area from 1981 to 1986 are shown schematically in Figure II-3. The caustic wastewater, which contains most of the ammonia, cyanide and nitrile, was acidified with muriatic acid to a pH of approximately 2.0 prior to steam stripping. This acidified solution entered the Former Cyanide Stripper Column (SWMU No. 25), where the ammonia and cyanide or nitrile were removed as distillate, which was burned in

TABLE II-1

Anticipated Chemicals and Concentrations in a Major Spill

Kay-Fries, Theodore, Alabama

Chemical	Maximum Percent (by Weight)	Temperature
ydrochloric Acid	1.6	120
odium Hydroxide	1.92	140
<pre>[ethanol</pre>	5.76	Amb*
lthanol	6.08	Amb
iethylbenzene (DEB)	7.04	Amb
cetonitrile	6.4	Amb
Primethyl Orthoformate	7.68	120
Priethyl Orthoformate	7.04	120
<pre>frimethyl Orthoacetate</pre>	7.68	120
Methoxy Ethanol	7.68	Amb
Sodium Methylate	1.92	Amb
3ilicon Tetrachloride	11.84	Amb
Methyl Trichlorosilane	10.24	Amb
Chloropropyl Trichlorosilane	9.6	Amb
Isobutyl Trichlorosilane	9.28	Amb
Vinyl Trichlorosilane	10.24	Amb
Silicate Product	8.32	120
Methylene Chloride	1.6	Amb
Ethylene Glycol - Water	1.28	Amb
Diesel Oil	5.12	Amb
Isobutyl Trimethoxy Silane	3.84	120
Vinyl Trimethoxy Silane	0.32	120
Vinyl Trimethoxyethoxy Silane	4.16	120
Chloropropyl Trimethoxy Silane	0.32	120
Methyl Trimethoxy Silane	0.32	120
System Condensate (Water)		212
Ethyl and Methylchloride in Ald		120
Hydrogen Cyanide	5.12	Amb

^{*} Ambient Temperature

(Reference 1)

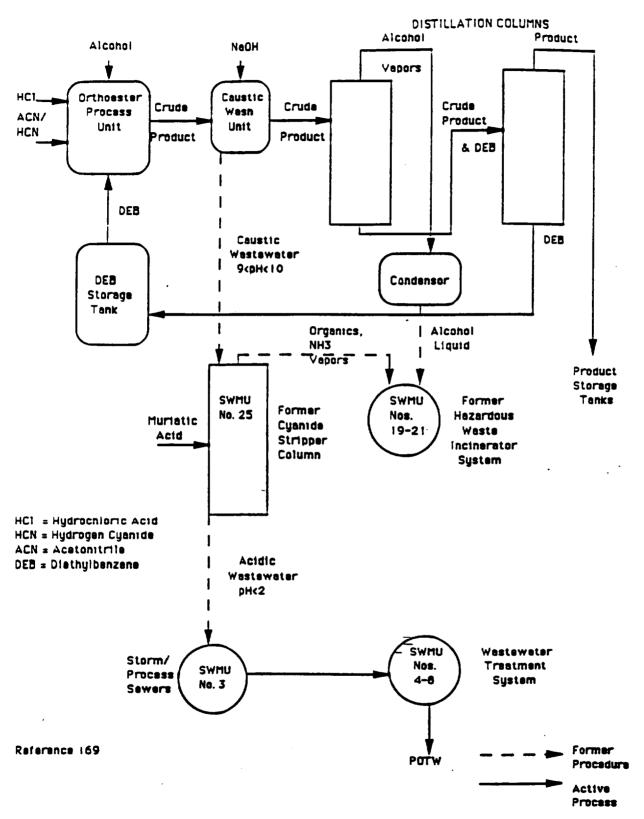


Figure 11-3. Schematic Diagram of Orthoester Process, including 1981-1986 Weste Management System, Kay-Fries, Theodore, Alabama.

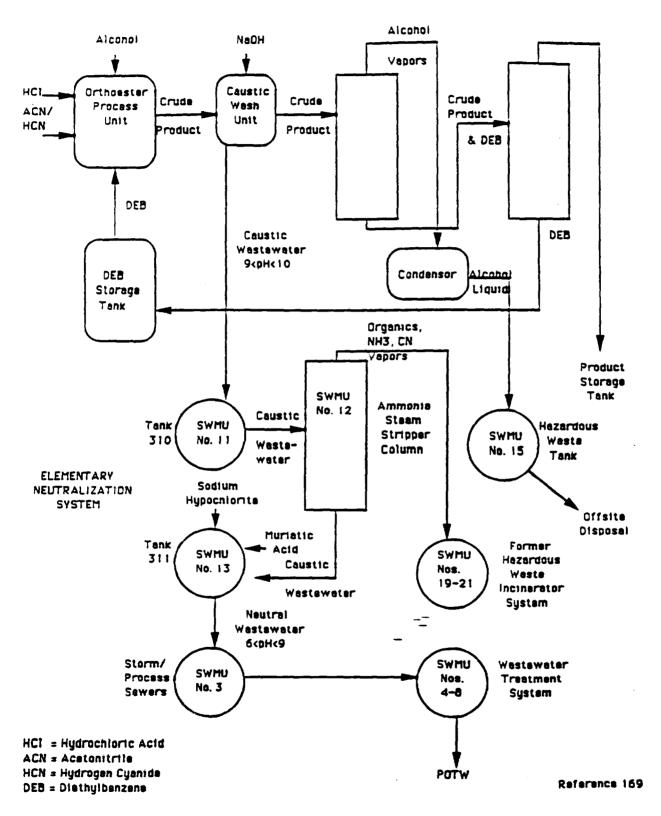


Figure 11-4. Schematic Diagram of Orthoester Process, including 1986-Present Waste Management System, Kay-Fries, Theodore, Alabama.

with discharges to the air for the system permitted by ADEM and the Mobile County Board of Health. The liquid alcohol is currently transferred to the Hazardous Waste Tank (SWMU No. 15), where it is held for less than 90 days, prior to offsite disposal. addition, a modification of caustic wastewater management in the process area eliminated the corrosive wastewater which was previously discharged to Wastewater Treatment System (SWMU Nos. 1-An Elementary Neutralization System was installed in the orthoester process area which consists of a Holding Tank, No. 310 (SWMU No. 11), an Ammonia Steam Stripper Column (SWMU No. 12), and Neutralization Tank, No. 311 (SWMU No. 13). Caustic wastewater with a pH of 9 to 10 enters the Holding Tank, then is sent to the Ammonia Stripper Column, where ammonia, cyanide and minor organics are steam-stripped from the wastewater. These vapors are still sent to the Former Hazardous Waste Incinerator (SWMU No. 19) for thermal destruction. The caustic wastewater, still having a pH between 9 and 10, is then treated with both muriatic acid and sodium hypochlorite in proper proportions to reduce the pH to a range of 6 to 9. Because the wastewater is no longer acidic, the sludge which forms in the Equalization and Aeration Basins is no longer characteristic (D002) hazardous waste. The Container Storage Area (SWMU No. 16) no longer manages corrosive sludges, and is currently used for less-than-90-day storage of flammable (D001) sludges which are collected biannually during system clean out operations (Reference 168).

A second waste, filter residue, was previously generated in the production of ethyl polysilicate. Ethanol, silicon tetrachloride and water were the raw materials in the process, which also produced hydrogen chloride as a very pure co-product which was marketed or used at Kay-Fries. The remaining reaction mixture, after the addition of activated carbon, produced the product, (ethyl polysilicate), and silicon dioxide (SiO₂). The silicon dioxide was filtered from the product mixture, with the wet filter residue consisting of silicon dioxide, polysilicate polymers, activated carbon, and crystalline silica (a filter aid). mixture was classified as characteristic ignitable waste (D001), as its flash point is below 140°F due to the presence of ethanol (References 63, 167). The filter residue was disposed as hazardous waste offsite at Emelle, Alabama. According to the facility representative, the ethyl polysilicate is no longer manufactured by Hüls-America in the United States, and the waste has not been generated at this facility in the past three years (Reference 167).

In 1984, hexamethyldisilane (HMDS) was added to the product lines in the silane/silicate process. The HMDS process is shown in Figure II-5. This product uses ammonia, hexane, and trimethylchlorosilane as raw materials, and produces HMDS and excess ammonia in the form of ammonium chloride (NH₄Cl). The ammonium chloride is removed by centrifuge in the silanes process area in the form of a salt cake. The ammonium chloride salt cake is drummed and placed in non-hazardous storage prior to offsite disposal at Emelle,

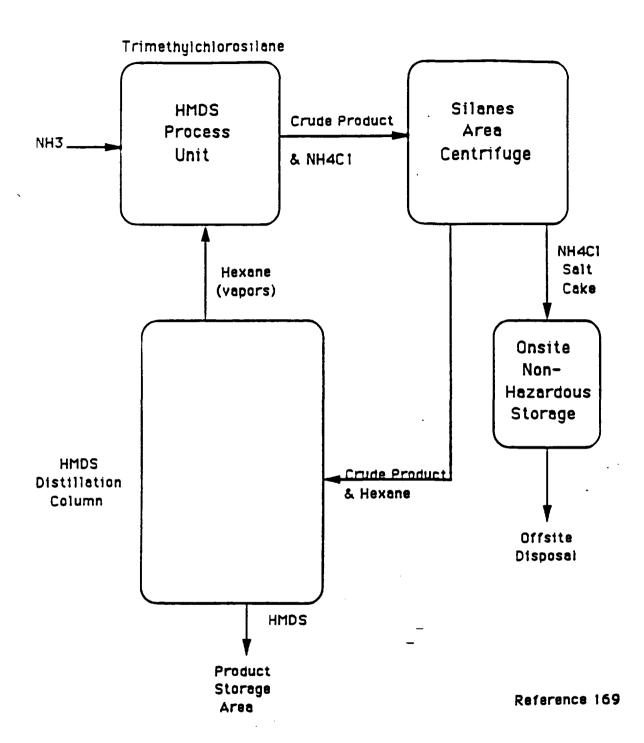


Figure 11-5. Schematic Diagram of HMDS Process, including Waste Management, Kay-Fries, Theodore, Alabama.

Alabama. In this process, hexane is removed from crude product in a distillation column, and returns to the HMDS process unit as a vapor. The product, HMDS, is removed from the bottom of the column and sent to the product storage area (Reference 168).

Prior to 1986, the alcohol/cyanide-nitrile wastestream from the orthoester stripper column was sent to the Hazardous Waste Incinerator System, where it was used to produce heat for the Waste Heat Boiler (SWMU No. 20). The system is shown schematically in Figure II-6. The waste alcohol, a liquid, was injected into one chamber of the Incinerator (SWMU No. 19), with the ammonia-cyanidenitrile vapors burned in the other chamber of the dual-chamber unit. The wastestream was burned at approximately 1600°F. system's energy-recovery efficiency ranged from 70 to 80 percent, with the efficiency of the Waste Heat Boiler being greater in the direct-fired mode than when the wastestream provided more of the An auxiliary burner using fuel oil rather than the wastestream for fuel, provided the increased efficiency (Reference 47). Because the wastestream was strongly acidic, it caused corrosion in the system. Corrosion was reduced by using the Caustic Scrubber (SWMU No. 21) to neutralize the wastestream to a pH of 6.0 to 9.0 prior to discharge to the atmosphere. incinerator system vents to the atmosphere through a stack which is approximately 35 feet high.

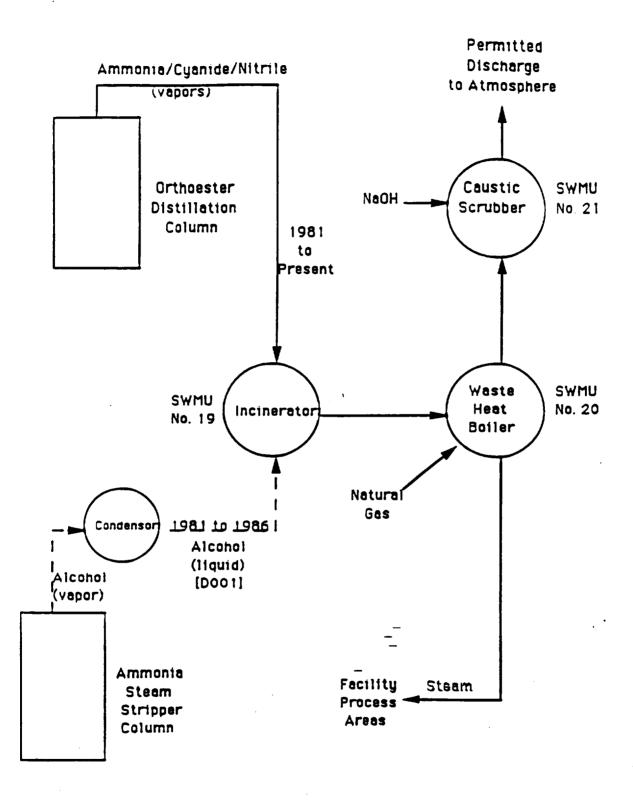


Figure 11-6. Schematic Diagram of Former Hazardous Waste Incinerator System,
Kay-Fries, Theodore, Alabama

Since 1986, the liquid alcohol wastestream is no longer injected into the Incinerator. The ammonia-cyanide-nitrile vapors are still thermally destroyed in the system.

The primary waste management system at the facility is the wastewater transfer and treatment system, which is shown schematically in Figure II-7. This system manages spills and contaminated runoff from the process area, along with a 0.5 gallon per minute (qpm) blowdown from an HCl purification process. The total wastewater flow to the wastewater treatment system is 50 gpm (Reference 2). Spills, washdown, and contaminated runoff from the process areas are collected in the Process Area Floor Trenches (SWMU No. 1), while spills and runoff from raw material/product handling at the rails are managed by the Rail Loading/Unloading Floor Trench (SWMU No. 2). Waste liquids in these units are transferred to the Lift Sump (SWMU No. 4) via the Storm/Process Sewer System (SWMU No. 3). Wastewater is pumped from the Lift Sump into the Equalization Basin (SWMU No. 5), through the Wastewater Mix Basin (SWMU No. 6), then to the Aeration Basin (SWMU No. 7). During the first five years of operation, sodium hydroxide was added to the wastewater in the Wastewater Mix Basin to raise the pH of the liquid and render it non-corrosive. After aeration and biodegradation in the Aeration Basin, the wastewater is discharged to the Clarifier (SWMU No. 8), prior to its discharge to the Mobile Publically-owned Treatment Works (POTW). Sludge in the Clarifier is periodically returned to the Aeration Basin. For several months

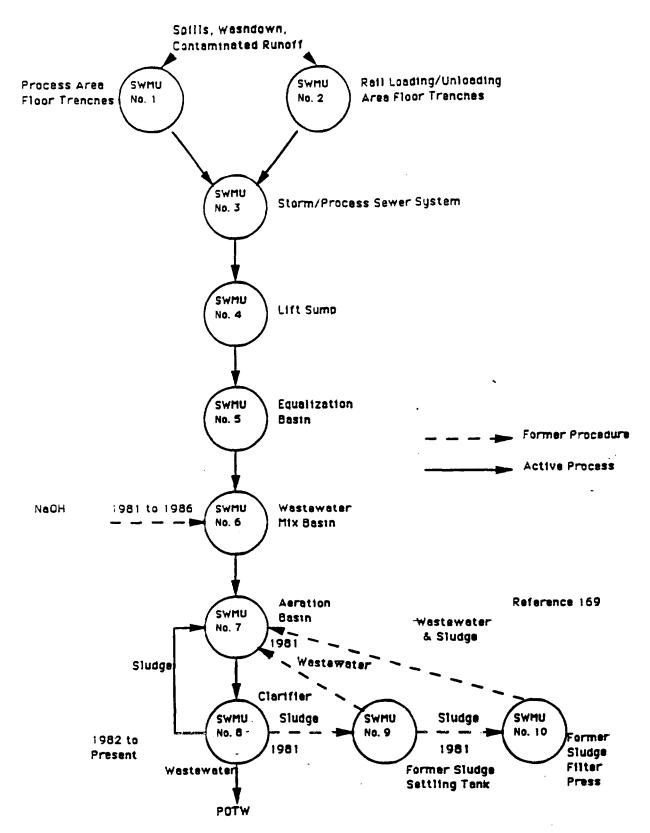


Figure II-7. Schematic Diagram of Wastewater Treatment System, Kay-Fries, Theodore, Albama.

in 1981, clarifier sludge was further dewatered in the Former Sludge Settling Tank and Former Sludge Filter Press (SWMU Nos. 9 and 10, respectively). The latter two units proved ineffective and were no longer used. Sludge from the Filter Press was returned to the Aeration Basin.

Regulatory History

In November 1980, the original operator, Brown and Root, submitted a Part A Hazardous Waste Permit Application to the Environmental Protection Agency (EPA). This application was modified in September 1984 by Dynamit Nobel of America, Inc. to eliminate one corrosive (D002) and one ignitable (D001) wastestream (Reference 29). On May 29, 1984, the Agency called in Kay-Fries' Part B Permit application, and the application was submitted on December 3, 1984 (Reference 30). EPA issued a Notice of Deficiency (NOD) to the facility on March 12, 1986, due to the overall lack of detail in the Part B Permit application (References 38, 65). The revised application was received by EPA on April 17, 1985. EPA responded with an NOD on November 27, 1985 (References 49, 58, 63). However, prior to receiving the second NOD, the facility decided to close the Container Storage Area (SWMU No. 16) (References 64, 69, 71). A closure plan was submitted for the unit, which was revised twice, and received state and EPA approval to close on November 20, 1986 (Reference 71). The facility now maintains the area as a lessthan-90-day container storage area. Shortly after receipt of the second NOD (Reference 65), the facility decided to close all of the hazardous waste units including the Equalization Basin (SWMU No. 6), the Aeration Basin (SWMU Nos. 5, and 7), and the Hazardous Waste Incinerator (SWMU No. 19) (References 60, 71, 77).

The main reason for the non-RCRA status of the Hazardous Waste Incinerator (SWMU No. 19), and the subsequent closure of the unit for burning hazardous waste, was the determination by the EPA in March 1986 that the unit was an incinerator, not a boiler, and was, therefore, a RCRA-regulated unit (Reference 51).

The closure plan for the Equalization and Aeration Basins (SWMU Nos. 5 and 7) was originally submitted in June 1986, and was amended on October 10, 1986 (References 64, 71, 77). After review of the amended closure plan, the unit was approved as clean closed by ADEM on December 4, 1987 (Reference 90), although they have not been certified as clean-closed. However, two facts are especially noteworthy regarding these units: (1) The Basins (SWMU Nos. 5 and 7) are still operational, although they no longer manage hazardous waste; and (2) groundwater contamination has been detected at the facility which can be directly attributed to these units (Reference 164).

The Basins (SWMU Nos. 5 and 7), which are part of the active wastewater treatment system, were originally determined to be RCRA-regulated units because the units were accepting highly acidic

wastes, which caused the wastewater in the impoundment to have a pH less than 2.0 (D002). This condition was changed by the installation of the Elementary Neutralization System (SWMU Nos. 11 -13), which neutralizes the wastewater prior to discharge into the basins. While there has been some contamination detected in the groundwater, the primary constituent detected, diethylbenzene (DEB), is not on the Appendix VIII or IX lists. Therefore, the groundwater contamination problem is being handled by the ADEM groundwater section, not the RCRA section (Reference 164).

During a joint ADEM/EPA site inspection on June 12, 1986, the Former Sludge Disposal Site (SWMU No. 23) and Former Construction Debris Disposal Site (SWMU No. 24) were identified as SWMUs (Reference 72). The units were both subsequently removed in October 1986 under closure approved by both ADEM and EPA (Reference 79).

Kay-Fries has received two Notice of Violations (NOV) and one Complaint and Compliance Order. The NOVs were issued on February 25, 1985 and April 3, 1986 (References 37, 67, 70). Both NOVs address minor issues, such as the lack of hazardous waste signs, not completing annual personnel training, and inconsistent information on the current Part A. The Compliance Order issued on August 30, 1985 cited an inadequate groundwater monitoring program and failure to maintain two feet of freeboard in impoundments (Reference 47). Kay-Fries installed two shallow downgradient

monitoring wells in November 1985 which addressed the major concern of the Compliance Order (References 54, 55).

Kay-Fries has 21 units which are presently permitted by the ADEM Air Pollution Control Commission. These same units have also obtained local air pollution permits from the Mobile County Board of Health. These permits are issued under the authority of the Alabama Air Pollution Control Act of 1971, as amended.

The majority of the units at Kay-Fries which have been issued air pollution permits from the State and County are process units. Examples of such units include the steam boilers, process tanks (storing raw product) and process equipment and devices (Reference 123-156). Units which are presently regulated by the local and state air pollution control agencies and were evaluated as SWMUs include the following:

- 1. Venturi Scrubber (SWMU No. 8)
- 2. Former Hazardous Waste Incinerator System Incinerator (SWMU No. 19)
- 3. Former Hazardous Waste Incinerator System Waste Heat Boiler (SWMU No. 20)
- 4. Former Hazardous Waste Incinerator System Caustic Scrubber (SWMU No. 20)

These units are described in greater detail in Section III.

Environmental and Demographic Setting

The facility is located in the Flood Plain, Terrace and Beach Subprovince of the Coastal Plain physiographic province (Reference 157) at the southern end of Mobile County, the southernmost county in Alabama (Figure II-8). The facility is located in the Coastal Lowlands District, which is generally flat to gently undulating plains which are locally swampy (Reference 94). Topographic relief on the facility (which is located at latitude 30°30′30″ and longitude 88°8′30″) varies from approximately 30 to 40 feet above mean sea level (msl), as shown on Figure II-2 (p. II-7). The area slopes gently toward Mobile Bay to the east (References 63, 94, 160).

The climate is generally subtropical, with long, hot, humid summers showing little day-to-day temperature variations. The coldest months are generally December through February, when there are frequent shifts between warm, moist Gulf air, and cool, dry continental air. Normal maximum daily temperatures in Mobile during the 1951 - 1984 recording period range from 61°F in January, to 91°F in July and August. Normal daily minimum temperatures during the same period vary between 41°F in January, and 75° in July and August. Record maximum and minimum temperatures during the recording period are 104°F in July 1952, and 7°F in January 1982, respectively.

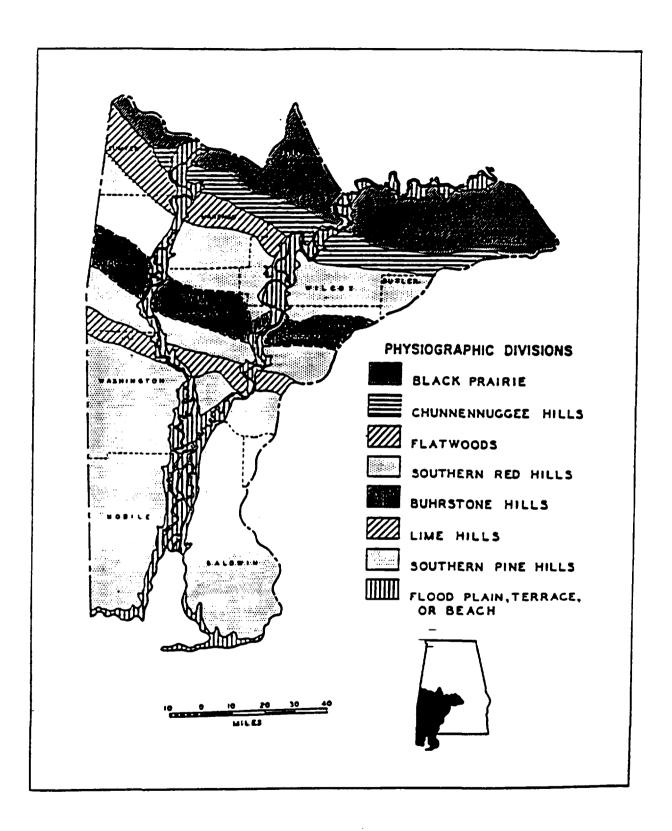


Figure II-8. Physiographic Divisions of Southwestern Alabama, Showing Kay-Fries Location (Reference 157).

Precipitation is high, averaging approximately 65 inches per year. July through September are normally rainy months, with March also averaging 6.5 inches of rainfall. October and November are the drier months, with precipitation averaging between 2.6 and 3.7 inches per month. The maximum daily rainfall during the recording period was 13.4 inches in April 1955. Snow seldom falls, with December through February being the most likely time for snowfall. Maximum daily snowfalls in excess of three inches occur during each of these months. Relative humidities are generally moderate to high, ranging from less than 55 percent at noon, to 90 percent at 6:00 a.m. in August (Reference 162).

The predominant wind directions in Mobile are from the north, north-east, and south, as shown in Figure II-9. Winds are generally less than 13 mph, with calm conditions occurring 11 percent of the time (Reference 59). The highest recorded wind during the period of record was 63 mph in September 1979. Tornadoes may occur between November and early May, with the greatest frequency in March and April. Tornadoes may also occur in association with the inland movement of tropical storms. Destructive hurricanes occur along the coastal area (where the facility is located) between July and November on an average of once every seven years. Mobile averages two days of thunderstorms per month during December, January, and February; 19 days in July; and 87 days per year (Reference 162).

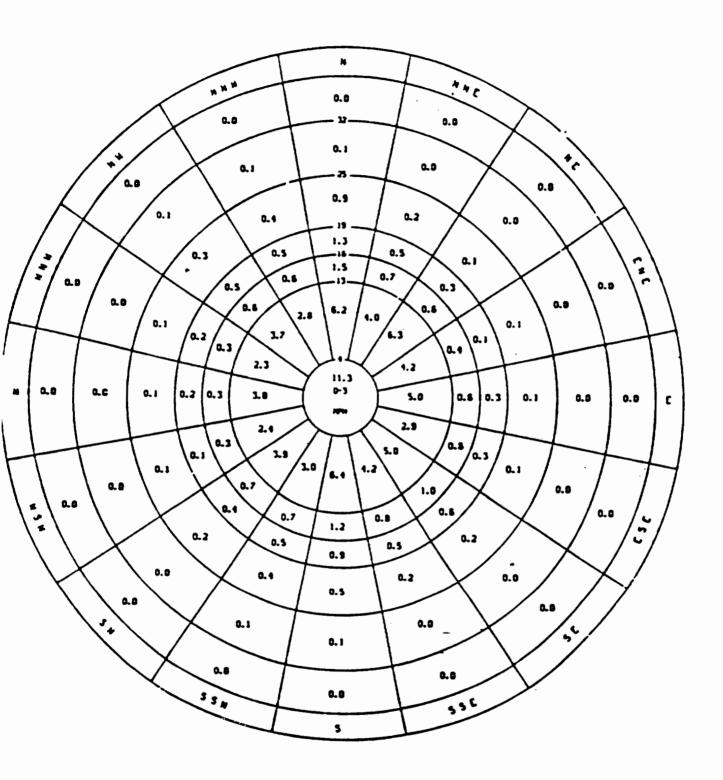


Figure II-9. Wind Rose for Mobile, Alabama (Reference 63).

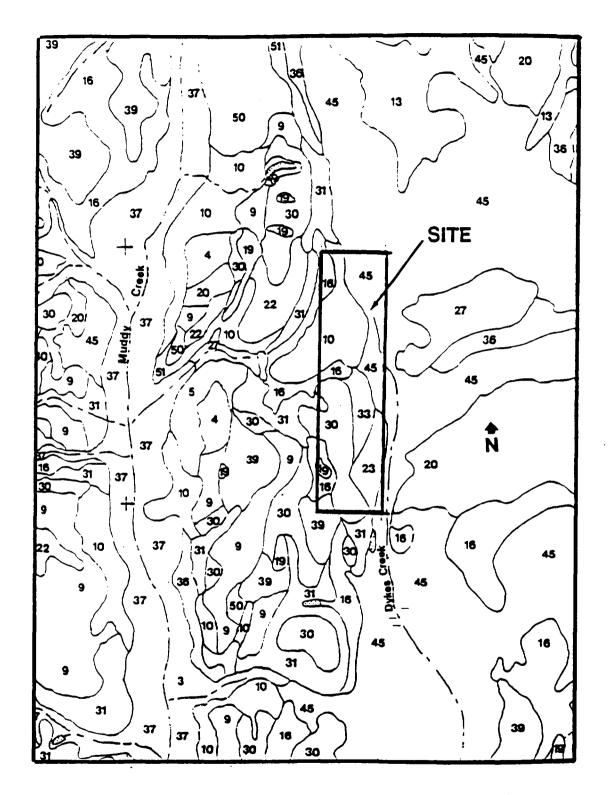


Figure II-10. Soil Map in Vicinity of Kay-Fries (Reference 159).

Legend

4,5 9,1	Water Bama Sandy loam (0-2%, 2%-5% slopes) Benndale sandy loam (0.2%, 2%-5% slopes)
13	Dorovan-Bibb association (0-1% slopes)
16	Escambia sandy loam (0.2% slopes)
19	Grady loam (0-1% slopes)
20	Harleston sandy loam (0-2% slopes)
22, 23	Heidel sandy loam (0-2%, 2%-5% slopes)
	Izagora-Bethera association (gently undulating)
27	Johnston-Pamlico association (0-1% slopes)
30,31	Malbis sandy loam (0.2%, 2%-5% slopes)
33	Notcher sandy loam (2-5% slopes)
36	Pactolus loamy sand (0-2% slopes)
37	Pamlico-Bibb complex (0-1% slopes)
39	Poarch sandy loam (0-2% slopes)
48	Saucier sandy loam (0-2% slopes)
45	Smithton sandy loam (0-1% slopes)
50	Troup loamy sand (0-5% slopes)

Reference 159

top of Smithton sandy loam in the northeastern section of the facility. For more detail on soil characteristics at the site, see Appendix F.

Kay-Fries is located in the Flood Plain, Terrace, and Beach subprovince of the Coastal Plain physiographic province, in the onshore extension of the Gulf Coast geosyncline and on the east flank of the Mississippi Embayment (Figure II-11). The key geologic formation underlying the facility are undifferentiated Pleistocene and Holocene clastics, the Pliocene Citronelle Formation, and undifferentiated Miocene Series sediments. These geologic units, with their geologic and hydrologic characteristics, are shown in Figure II-12.

Unconsolidated Miocene sediments, which are laterally and vertically discontinuous, consist primarily of very-fine to coarse-grained sands, which are locally conglomerate and contain minor crossbedding. A sandy, silty clay is also present in the upper section, while the lower half of the Miocene series in Mobile County consists of limestone and marl. Miocene sediments in the Kay-Fries area are 1900 to 2200 feet thick and dip approximately 10 to 45 feet per mile (References 25, 94).

The overlying Citronelle Formation has a variable lithology, both vertically and horizontally, consisting of fine- to coarse-grained sandstone, gravelly sand, and lenses of sandy clay and clay balls.

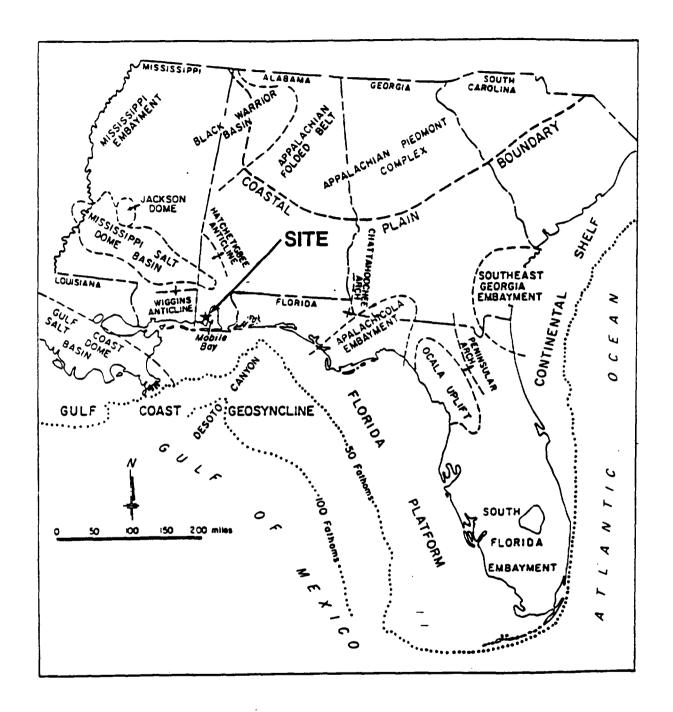


Figure II-11. Map Showing Regional Geologic Setting of Kay-Fries Facility.

Series	Geologie unite	Thickness (feet)	Lithelegy	YI+I4	Quality of water		
Holocono and Ploistecono	Alluvium, law-terrace, and constal deposits	0-15 0	Bend, white, gray, arange, and red, very fine to course- grained, contains gravel in places; gray and orange anndy clay.	Will yield 10 gpm where cohurated sands are of suffi- cient thickness. Potential source of 0.5 to 1 mgd per well in the Mobile River basin.	Water generally suitable for most uses but commonly contains from in escess of 0,3 mg/l and may be sufficiently acidic to be corrosive. Locally, in areas close to Mobile Bay and Mississippi Sound, water is very hard, has high chieride and dissolved-solids contents, and contains from in escess of 0,3 mg/l.		
	High-torrace deposits	0-40		Will yield 10 gpm or more where saturated sands are of sufficient thick- ness.	Probably soft and low in dissolved solids. May contain from in excess of 8.3 mg/l.		
Pilosono	Citronolle Fermation	0-200	Sand, brown, rod, and eronge, fines to consor- grained, gravelly in places, contains clay bells and partings; gray, eronge, and brown lenticular sendy clay, ferruginous comented sandstone,	Will yield 1 mgd	Water generally in soft and low in disselved solids but may contain from in excess of 0,3 mg/l and may be sufficiently ecidic to be corresive. In areas adjacent to Mobile River, Mobile Bay, and Mississippi Sound, water may have a disselved-solids content that exceeds 1,000 mg/l, a suffirm edor, and a chieride content that exceeds 500 mg/l.		
Miecene	Miccone Series undifferentiated	400-3,406	Sand, gray, eronge, and red, very fine to course-grained, contains gravel in places; gray thin-bedded to mase- sive sandy silty clay; gray thin-bedded limestone in subsurface,	Miscare			

Figure II-12. Lithologic and Hydrologic Characteristics of Stratigraphic Units of Interest , Kay-Fries (Reference 25).

The thickness of the Citronelle near the facility is approximately 70 feet, with dips of 5 to 12 feet per mile (References 25, 94).

Exposed sediments of the Pleistocene-Holocene series consist of alluvial, low terrace, and coastal deposits composed of unconsolidated sandy clay, silt, sand, and gravel. The terrace deposits represent floodplain remnants and reworked sediments from the older Citronelle and Miocene formations. Individual sand and gravel beds in the Holocene alluvium are lenticular in shape and represent buried channel deposits. The sands vary in grain size from very fine- to coarse-grained. The Pleistocene-Holocene deposits in the vicinity of Kay-Fries are approximately 70 feet thick, with a southwesterly dip of 5 to 12 feet per mile (Reference 25).

The principal aquifer in the vicinity of Kay-Fries is the Miocene-Pliocene aquifer which is under confined (artesian) conditions at the facility. The top of the aquifer generally occurs 125 to 150 feet below the land surface, with individual sand beds being 50 to 100 feet thick. The regional groundwater flow is south-southwesterly, the same direction as regional dip. Well yields may exceed one million gallons per day. Groundwater in this aquifer is recharged by precipitation in areas west and north of the facility, as shown in Figure II-13 (Reference 25).

Groundwater is present in the Pleistocene-Holocene deposits under unconfined, or water-table, conditions. The aquifer is recharged

by local precipitation, as shown in Figure II-13 (Page II-35). water-table aguifer may discharge to local streams and form swamps in topographic lows, such as near Dykes Creek to the east. yields from the shallow aguifer may be as high as 0.5 to 1.0 million gallons per day, where the saturated thickness of the sand is sufficient. Sand and gravel units are generally too thin around the facility for significant aquifer usage. However, small quantities of good quality water are available for domestic use. The general stratigraphic and hydraulic relationship between the two aquifers is shown in Figure II-14. Local ground-water flow in the shallow aguifer is to east-northeast, as shown in Figure II-15, using the Kay-Fries monitoring well network (Reference 25). A pump test using monitoring wells MW-3, MW-4, MW-5 yielded a hydraulic conductivity of 2.65 X 10-3 feet per second for the gravelly sand zone which is present at the facility below 20 foot depth. value was obtained assuming an average aguifer thickness of 50 feet and analyzing the data using the modified Jacob Method (Reference 55).

The monitoring well system at Kay-Fries consists of seven wells:

(1) one upgradient (No. 1) and four downgradient wells (Nos. 2 to

5) drilled to a depth of 30 feet or more; and (2) two shallow
downgradient wells (Nos. 6 and 7) drilled to a depth of 10 feet

(Figure II-16). Since 1983, the five deeper wells were monitored
for indicator parameters (pH, TOC, TOX, and specific conductance).

Analyses for drinking water parameters were performed in 1983 and

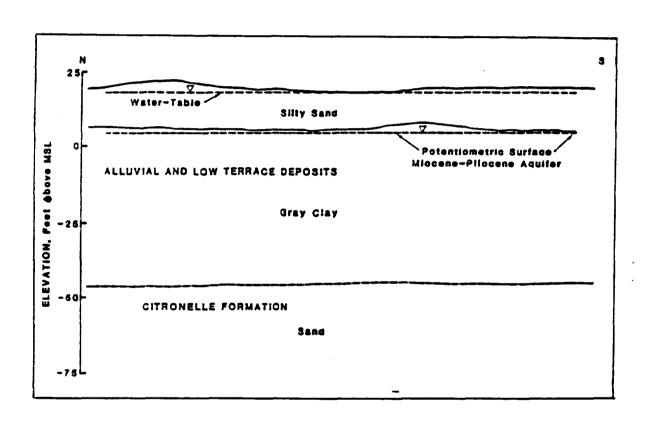


Figure II-14. Schematic Cross Section at Kay-Fries Facility, Theodore, Alabama (Reference 25).

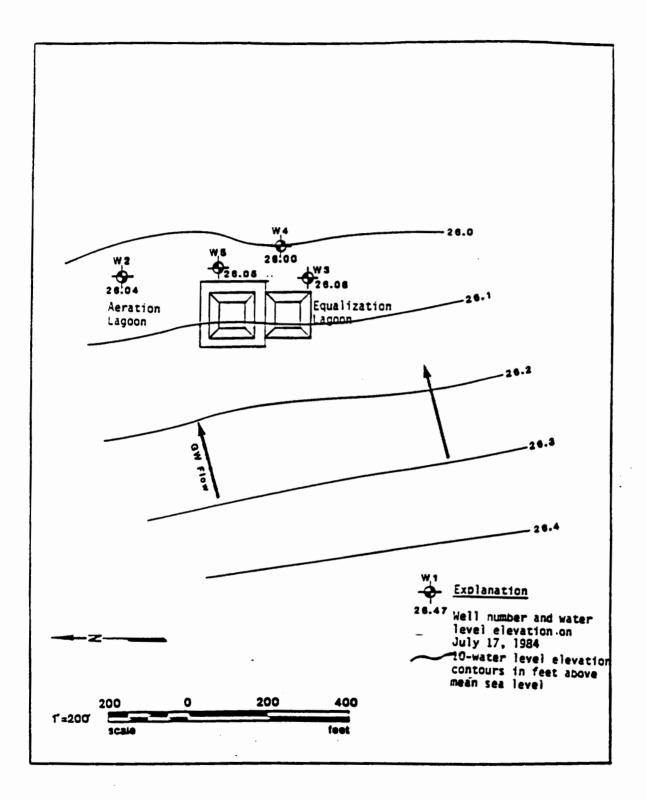


Figure II-15. Potentiometric Map of Kay-Fries, July 17, 1984 (Reference 25).

early 1984. Monitoring wells Nos. 6 and 7 were installed in October 1985 to monitor for site-specific parameters--acetonitrile, hydrogen cyanide, and diethylbenzene (DEB). Significant concentrations of DEB were detected in Well No. 6, including 379 ug/l during the November 9, 1987 Compliance Monitoring Inspection (CME). A list of the parameters detected above detection limits or drinking water standards are presented in Table II-3 (References 89, 94). 8Available analyses of indicator parameters are presented in Appendix E.

According to an organic chemist at Stanford Research Institute (Reference 170), diethylbenzene (DEB), the primary ground-water contaminant, will degrade through oxidation, rather than by cleavage of the ethyl radical, in a manner similar to ethyl benzene. During oxidation and biodegradation, DEB will tend to form alcohols, then ketones, and finally acids.

TABLE II-3

Parameters in Monitoring Wells (Con't.)

Date	Well No.	<u>Parameter</u>	Concentration
7/22/83	1	Cadmium (D006)	0.013 mg/l*
7/22/83	2	Cadmium	0.065 mg/l
7/22/83	3	Cadmium	0.027 mg/l
7/22/83	4	Cadmium	0.061 mg/16
7/22/83	5	Cadmium	0.018 mg/l
7/22/83	4	Iron	0.42 mg/l
7/22/83	5	Iron	0.46 mg/l
7/22/83	1	Manganese	0.12 mg/l*
7/22/83	5	Manganese	0.10 mg/l
10/13/83	4	Iron	0.70 mg/l
10/13/83	5	Manganese	0.06 mg/l
3/14/85	1	Phenols (U188+)	0.04 mg/l*
3/14/85	2 ·	Phenols	0.04 mg/l
3/14/85	4	Phenols	0.04 mg/l
3/14/85	5	Phenols	0.04 mg/l
3/5/86	6	Diethylbenzene	3.5 ppb
3/5/86	7	2-(2-(2-butoxyethoxy)ethoxy)ethanol	23 ppb
3/5/86	4	Tetrahydrofuran (U213)	22 ppb
3/7/86	1	2-(2-(2-butoxyethoxy)ethoxy)ethanol	320 ppb*
3/7/86	4 .	2-(2-(2-butoxyethoxy)ethoxy)ethanol	34 ppb
3/7/86	6	2-(2-(2-butoxyethoxy)ethoxy)ethanol	9.3 ppb
4/18/86	6	Diethylbenzene	3.9 ppb
4/18/86	6	Benzene (U019)	1.8 ppb
10/16/86	6	Diethylbenzene	1.0 ppb
10/16/86	6	4-(4-Ethylphenyl)ethanone	2.3 ppb
10/16/86	6	Unidentified Compound	21 ppb
10/16/86	6	Chloromethane	2.9 ppb
10/16/86	• 6	Methylene Chloride (U080)	35 ppb
10/16/86	7	Methylene Chloride (UO80)	37 ppb
4/23/87	6	Methylene Chloride (UOSO)	13 ppb
4/23/87	7	Methylene Chloride	12 ppb
4/23/87	6	Diethylbenzene	110 ppb
6/30/87	6	Methylene Chloride (UO80)	24 ppb

TABLE II-3
Parameters in Monitoring Wells

Date	Well No.	Parameter	<u>Concentration</u>
6/30/87	7	Methylene Chloride (UO80)	17 ppb
6/30/87	7	Acetone (U002)	11 ppb
6/30/87	6	Diethylbenzene	24 ppb
11/9/87	6	Diethylbenzene	379 ppb
4/19/88	6	Diethylbenzene	410 ppb
8/30/88	6	Diethylbenzene	103 ppb
10/25/88	6	Diethylbenzene	135 ppb

References 94, 96, 105

^{*}Upgradient well concentrations

Page 2 of 51

SWMU	NUMBER:	1	PHOTOGRAPH NUMBER:	No Photograph
		_		

NAME: Process Area Floor Trenches

TYPE OF UNIT: Wastewater Transfer Unit

PERIOD OF OPERATION: 1981 to Present

PHYSICAL DESCRIPTION AND CONDITION:

The unit consists of unsealed concrete trenches in the center of the floor of each manufacturing area throughout the central portion of the facility. The trenches are three feet wide, by three feet deep, and extend the length of each process building. The units are covered with a steel grating. The trenches receive leaks, spills, and washdown water from the adjacent process areas. The building floors slope towards the unit to facilitate liquid movement. Liquids in the unit are transported via the Storm/Process Sewer System (SWMU No. 3) to the Lift Sump (SWMU No. 4). The example of the unit observed during the VSI appeared to have good integrity.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit manages leaks, spills, and washdown waters which may contain any of the organic constituents used in the chemical intermediates manufacturing process.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)

Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases from the unit, and no evidence of releases was noted during the VSI.

RECOMMENDATIONS:	No Further Action	(X)
	RFA Phase II Sampling	()
	RFI Necessary	()

Project Name: Kay-Fries Date: October 1990

Page 4 of 51

SWMU NUMBER: 2 PHOTOGRAPH NUMBER: 1-19

NAME: Rail Loading/Unloading Area with Floor Trench

TYPE OF UNIT: Wastewater/Spill Collection

PERIOD OF OPERATION: 1981 to Present

PHYSICAL DESCRIPTION AND CONDITION:

The unit is located in the east-central portion of the facility. The floor trench is located within the concrete pad under the above-grade steel loading platforms adjacent to the facility railroad tracks. The trench collects spills and contaminated runoff which may contain any of the raw materials or chemical intermediate products present at the facility. Liquids in the trench are discharged to the Lift Sump (SWMU No. 4) via the Storm/Process Sewer System (SWMU No. 3). The unit appeared to have good integrity at the time of the VSI.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit manages spills and runoff contaminated with any of the organic constituents in the chemical intermediates manufactured at the facility or the raw materials used in the manufacturing process.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)

Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases from the unit, and no evidence of releases was noted during the VSI.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ()

RFA Phase II Sampling ()

RFI Necessary (

Project Name: Kay-Fries Date: October 1990

Page 5 of 51

REFERENCES: 164

COMMENTS: None

Project Name: Kay-Fries

Kay-Fries Theodore, Alabama

Page 6 of 51

SWMU	NUMBER:	3	PHOTOGRAPH NUMBER:	No	Photograph
Dutto	HUMBER.		Inological it wonder.	110	rnocograpii

NAME: Storm/Process Sewer System

TYPE OF UNIT: Wastewater Transfer Unit

PERIOD OF OPERATION: 1981 to Present

PHYSICAL DESCRIPTION AND CONDITION:

The Storm/Process Sewers are located throughout the center of the process area. The unit consists of a network of underground sewer lines which transport liquid wastes from the Laboratory/Office Building, Maintenance Locker Rooms/Warehouse Building, Process Area Control Rooms, Tank Farm, Loading/Unloading locations, and all other paved process areas to the Lift Sump (SWMU No. 4), then to other units in the wastewater treatment system. The pipes are constructed of Bond Strand woven fiberglass. A schematic diagram showing the general location of the Storm/Process Sewers is shown in Figure III-1. The unit was not directly observed or photographed during the VSI due to its underground location.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit managed contaminated runoff from within the process areas and process wastewaters, both of which could contain any of the raw materials or organic chemical intermediate products present at the facility.

RELEASE PATHWAYS: Air (U) Surface Water (U) Soil (U)

Ground Water (U) Subsurface Gas (U)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases from this unit. Visual evidence of releases could not be obtained during the VSI due to the unit's underground location.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ()
RFI Necessary ()

Project Name: Kay-Fries Date: October 1990

Page 8 of 51

REFERENCES: 63

COMMENTS:

The integrity of the unit could not be evaulated due to it's underground location. The facility should perform integrity tests on the unit to verify that leaks have not occurred. Organic wastewaters may impact fiberglass more than

steel piping.

Project Name: Kay-Fries

Theodore, Alabama

Page 9 of 51

SWMU NUMBER: 4 PHOTOGRAPH NUMBER: 1-2

NAME: Lift Sump

TYPE OF UNIT: Wastewater Collection Unit

PERIOD OF OPERATION: 1981 to Present

PHYSICAL DESCRIPTION AND CONDITION:

The Lift Sump is located east of the Equalization Basin in the northern portion of the facility. The unit is a below-grade, unsealed concrete sump covered with a steel grating, which has a capacity of 6,000 gallons. The unit receives spills and contaminated runoff from the Storm/Process Sewer System (SWMU No. 3), which are then pumped to the Equalization Basin (SWMU No. 5). According to the revised closure plan for the basins, the unit and associated piping will be the retention unit for major spills or excess contaminated rainwater so that hazardous wastes will not enter the impoundments following clean closure. Because of its below-grade location and active operation, the integrity of the sump could not be fully assessed during the VSI.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit managed spills and contaminated runoff from the process areas which was characteristic corrosive waste (D002) and may have contained any of the raw materials or organic products produced at the facility.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (U)*

Ground Water (U) * Subsurface Gas (U) *

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases from the unit, and no visual evidence of releases was noted during the VSI.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ()
RFI Necessary ()

Project Name: Kay-Fries Date: October 1990

Page 10 of 51

REFERENCES: 70, 77, 164, 167

COMMENTS:

* Because of the uncertain integrity of the unit, the soil and groundwater release potentials and subsurface gas generation potentials are unknown. The facility should verify the integrity of the sump to ensure its ability to contain any large releases to the Storm/Process

Sewer System.

Project Name: Kay-Fries

Theodore, Alabama

Page 11 of 51

SWMU NUMBER:

5

PHOTOGRAPH NUMBERS: 1-1 and 1-10

NAME:

Equalization Basin

TYPE OF UNIT:

Surface Impoundment

PERIOD OF OPERATION: 198

1981 to Present

PHYSICAL DESCRIPTION AND CONDITION:

The unit is an above-grade surface impoundment located in the north-central portion of the facility. The basin has a capacity of 275,000 gallons and measures approximately 80 feet by 80 feet. The unit receives process wastewater from the Lift Sump (SWMU No. 4). Based on an average flow of 70,000 gallons per day, the basin has a retention time of approximately 3.5 days, during which the wastewater from all process areas is reportedly mixed in the unit. The unit is enclosed by five foot high sandy-clay embankments and lined with compacted clay with a permeability of approximately 106 The clay-lined basin was originally equipped with a reinforced PVC synthetic liner. After the synthetic liner failed in June 1983, it was replaced with a double-liner system constructed of high-density polyethylene (HDPE). The original liner and other materials from the unit (including sand, pea gravel, and some clay) were temporarily stored in the Former Equalization Basin Sludge/Liner Storage Site (SWMU No. 16) prior to offsite disposal at Emelle, Alabama. Wastewater in the unit goes through the Wastewater Mixing Basin (SWMU No. 6) adjacent to the Lift Sump (SWMU No. 4) prior to discharge in the Aeration Basin (SWMU No. 7).

The unit currently has primary and secondary leak detection systems. The primary leak detection system consists of perforated pipe without sumps which is used for leachate collected between the liners. According to facility representatives, the past operating practice was to flush the sand layer in the primary leak detection system, pump the sand layer dry, then sample any fluid detected in the primary system. The secondary leak detection system includes a sump and a vent system to prevent gas retention beneath the liners.

Project Name: Kay-Fries

Theodore, Alabama

Page 12 of 51

The Basin was an interim status unit because it managed acidic wastewaters which are characteristically corrosive (D002) hazardous wastes. Process changes have reportedly neutralized the process wastewaters to a pH between 6.0 and 9.0, rendering them non-corrosive. The facility is in the process of clean closing the unit for accepting hazardous wastes, but still operates the unit. Certification of clean closure is awaiting an assessment of downgradient groundwater contamination.

The unit appeared to have good integrity at the time of the VSI. No staining was noted on the exterior of the clay berms.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit manages facility process wastewaters and spills which may contain any of the raw materials or chemical intermediate products found at the facility. The process wastewaters originally managed by the unit were acidic, with a pH of 2.0 or less. This meant that the unit managed characteristic corrosive (D002) waste. Process modifications in 1986 reportedly elevated the pH of the wastewater to the range between 6 and 9. However, the pH of the influent to the unit varies widely over short time periods, as indicated by analyses in July 1986, January 1987, and November 1987, when pH variations were 1.4 to 12.2; 1.8 to 9.9; and 2.3 to 11.2, respectively. Based on only two fluid samples from the basin in July 1986, the pH was approximately 10.5. A characterization of the wastes and soil sampling for closure of the unit is presented in Appendix D-1.

RELEASE PATHWAYS: Air (L-M) Surface Water (L) Soil (L)

Ground Water (L) Subsurface Gas (L)

Date: October 1990

HISTORY AND/OR EVIDENCE OF RELEASE(s):

The unit overflowed due to heavy rains in February 1983 and August 1984. In addition, the original PVC liner failed in June 1983 and had to be replaced in September and October 1983. According to the facility representative, the PVC liner failed because it was

Project Name: Kay-Fries

Page 13 of 51

decomposed by a concentrated slug of diethylbenzene (DEB). DEB contamination has been detected in downgradient monitoring well No. 6 with concentrations up to 379 ppb.

RECOMMENDATIONS: No Further Action ()
RFA Phase II Sampling (X)
RFI Necessary ()

REFERENCES: 7, 11, 14, 15, 16, 22, 25, 63, 72, 76, 86, 89, 115,

164, 167

COMMENTS:

Historically, there were releases to the soil in 1983 and 1984 due to unit overflow and liner failure. The influent to the unit has not been analyzed for Appendix IX constituents to determine if hazardous constituents are present in the wastewater. Phase II sampling of the influent wastewater is recommended for this unit.

Project Name: Kay-Fries

Theodore, Alabama

Page 14 of 51

SWMU NUMBER:

6

PHOTOGRAPH NUMBER: 1-2

NAME:

Wastewater Mix Basin

TYPE OF UNIT:

Wastewater Treatment

PERIOD OF OPERATION: 1981 to Present

PHYSICAL DESCRIPTION AND CONDITION:

The Mix Basin is located on west end of the Lift Sump in the northern portion of the facility. The unit is an above-grade, 600gallon, concrete tank which is elevated 1.5 feet above ground level on a concrete pad. The unit receives gravity-fed wastewater from the Equalization Basin (SWMU No. 5) and discharges the water to the Aeration Basin (SWMU No. 7) via a six-inch steel pipe which is five From 1981 to 1986 the unit functioned as a feet above grade. neutralization basin, where caustic soda (NaOH) was added to acidic wastewater discharge into the Aeration Basin. Since 1986, the wastewater stream has been neutralized in Tank No. 311 (SWMU No. 13) in the process area, and non-corrosive wastewater is gravityfed through the unit before discharging to the Aeration Basin. According to the facility representative, caustic soda may still be added to the wastewater in the unit to ensure that a neutral pH is maintained. The exterior of the unit was stained in several areas during the VSI.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit formerly managed acidic process wastewaters which were neutralized in the unit using caustic soda (NaOH). The unit currently manages non-corrosive wastewaters.

RELEASE PATHWAYS:

Air (L)

Surface Water (L)

Soil (L)

Ground Water (L)

Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases from the unit. Staining was noted during the VSI on the exterior of the unit indicating that releases to the soil may have occurred.

Project Name: Kay

Kay-Fries

Theodore, Alabama

Page 15 of 51

RECOMMENDATIONS: No Further Action (X)*
RFA Phase II Sampling ()

RFI Necessary ()

REFERENCES: 25, 164, 167

COMMENTS:

*Previous corrosive characteristics of the wastewater and staining on the unit exterior indicate that D002 wastes may have been released to the soil. Sampling is not recommended at this unit due to the greater environmental impact of the adjacent Equalization and Aeration Basins. Releases from this unit would be minor compared to the basins.

Project Name: Kay-Fries Date: October 1990

Page 16 of 51

SWMU NUMBER:

7

PHOTOGRAPH NUMBERS: 1-3 and 1-10

NAME:

Aeration Basin

TYPE OF UNIT:

Surface Impoundment

PERIOD OF OPERATION: 198

1981 to Present

PHYSICAL DESCRIPTION AND CONDITION:

The unit is an above-grade surface impoundment located in the north-central portion of the facility. The basin, which measures approximately 150 feet by 150 feet and has a capacity of 785,000 gallons, was used to biodegrade the organic compounds in the wastewater using aerobic bacteria following neutralization in the Mixing Basin (SWMU No. 6). Based on an average wastewater flow of 70,000 gallons per day, the unit has an approximate 11.5-day retention time before wastewater is discharged to the Clarifier Ammonia is removed and BOD and COD levels are (SWMU No. 8). reduced using aeration and the bacteria. Wastewater from the unit goes to the Clarifier (SWMU No. 8) prior to discharge to the Mobile The unit is enclosed by five-foot sandy-clay Sewer System. embankments and lined with compacted clay with a permeability of approximately 106 cm/sec. The clay-lined basin was originally equipped with a reinforced PVC synthetic liner. This liner failed under the unit in June 1983 due to an underlying gas bubble, which caught the liner in at least one of the aerators. The PVC liner was replaced by a double-liner system constructed of high-density polyethylene (HDPE). The discarded liner and sludge from the unit were disposed onsite in the Former Sludge Disposal Area (SWMU No. 21).

The unit currently has primary and secondary leak detection systems. The primary leak detection system consists of perforated pipe without a sump used between the liners for leachate collection. The secondary leak detection system, which includes a sump and a vent system, has been installed to prevent gas retention beneath the liners, such as that which caused the PVC liner failure.

Project Name: Kay-Fries

Theodore, Alabama

Page 17 of 51

The unit appeared to have good integrity at the time of the VSI. A strong organic odor was present at the unit during the inspection.

The Basin was an interim status unit because it managed acidic wastewaters which are characteristically corrosive (D002) hazardous wastes. Process changes have reportedly neutralized the process wastewaters to a pH between 6.0 and 9.0, rendered them non-corrosive. The facility is in the process of clean closing the unit for accepting hazardous wastes, but still operates the unit. Certification of clean closure is awaiting an assessment of downgradient groundwater contamination by the ADEM Water Division.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit manages facility process wastewaters and spills which may contain any of the raw materials or chemical intermediate products found at the facility. The pH of the influent to the unit, as sampled in January 1987, varied from 3.1 to 9.2. A characterization of the wastes and surrounding soils for closure of the unit is presented as Appendix D-1. A 1982 analysis of sludge from the unit is presented as Appendix D-2.

RELEASE PATHWAYS: Air (M) Surface Water (L) Soil (L)

Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

The PVC liner in the unit failed in June 1983 due to an underlying gas bubble. Reportedly, the underlying clay liner retained the liquids while the PVC liner was replaced.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ()
RFI Necessary ()

REFERENCES: 7, 8, 11, 12, 14, 15, 16, 22, 63, 72, 115, 164, 167

COMMENTS: Historically, there were releases to the soil in

1983 and 1984 due to liner failure and unit

overflow.

Project Name: Kay-Fries Date: October 1990

Page 18 of 51

SWMU NUMBER: PHOTOGRAPH NUMBERS: 1-4 and 1-5 8

NAME: Clarifier

Wastewater Treatment Unit TYPE OF UNIT:

1981 to Present PERIOD OF OPERATION:

PHYSICAL DESCRIPTION AND CONDITION:

The unit is located east of the Aeration Basin (SWMU No. 7) in the northern portion of the facility. The unit is an above-grade concrete clarifier basin measuring 20 feet in diameter and 6 feet The unit receives wastewater from the Aeration Basin (SWMU No. 7). Sludge which settles in the unit is currently returned to the Aeration Basin. In 1981, the sludge in the unit was dewatered in the Former Sludge Settling Tank (SWMU No. 9), then pressed in the Former Sludge Filter Press (SWMU No. 10). The wastewater in the unit is discharged to the Mobile POTW through a small weir on the east side of the unit. The unit appeared to have good integrity at the time of the VSI.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit manages wastewater and sludge from the Aeration Basin which may contain any of the raw materials or chemical intermediate products found at the facility. A chemical analysis of the sludge in the Aeration Basin presented in Appendix D-2 is similar to the sludge which would be managed in the clarifier.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)

> Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases or visual evidence of release from the unit.

RECOMMENDATIONS: No Further Action (X) RFA Phase II Sampling

RFI Necessary

Project Name: Kay-Fries Date: October 1990

Page 19 of 51

REFERENCES: 5, 25, 164

COMMENTS: None

Project Name: Kay-Frie

Kay-Fries Theodore, Alabama

Page 20 of 51

SWMU NUMBER:

9

PHOTOGRAPH NUMBER: 1-7

NAME:

Former Sludge Settling Tank

TYPE OF UNIT:

Wastewater Treatment Unit

PERIOD OF OPERATION: 1981

PHYSICAL DESCRIPTION AND CONDITION:

The Former Sludge Settling Tank is located east of the Aeration Basin (SWMU No. 7) in the northern portion of the facility. The unit is a closed vertical steel tank on an uncurbed concrete pad, with a 3,760-gallon capacity. When in operation, the tank received sludge from the Clarifier (SWMU No. 8). The sludge was allowed to settle in the unit, with the water removed from the top of the tank and pumped back to the Aeration Basin. The sludge was removed from the bottom of the unit and pumped to the Former Sludge Filter Press (SWMU No. 10) in the Sludge Filter House. The tank and filter press were used for only a few months, as the process was found to be ineffective and resulted in sludge storage problems. Stains were noted on the exterior of the tank and the adjacent gravel during the VSI. According to the facility representative, the unit was not decontaminated after it ceased operating.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit managed wastewater and sludge which may have contained any of the raw materials and chemical intermediate products found at the facility.

RELEASE PATHWAYS:

Air (L)

Surface Water (L)

Soil (L)

Ground Water (L)

Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There is no documented evidence of releases from the unit. Staining was noted on the exterior of the unit.

Project Name: Kay-Fries

Theodore, Alabama

Page 21 of 51

RECOMMENDATIONS: No Further Action (X)*
RFA Phase II Sampling ()
RFI Necessary ()

REFERENCES: 164

COMMENTS:

* Facility should remove any residual sludge and wastewater and place it in the Aeration Basin, then decontaminate the unit.

Project Name: Kay-Fries

Theodore, Alabama

Page 22 of 51

SWMU NUMBER:

10

PHOTOGRAPH NUMBER: 1-6

NAME:

Former Sludge Filter Press

TYPE OF UNIT:

Wastewater Treatment Unit

PERIOD OF OPERATION: 1981

PHYSICAL DESCRIPTION AND CONDITION:

The unit is located in a concrete-block southeast building of the Aeration Basin (SWMU No. 7) and south of the Clarifier and Former Sludge Settling Tank (SWMU Nos. 8 and 9, respectively). The Filter Press was located 10 feet above the building's concrete pad on a steel grating supported on steel girders. The press was used to dewater wastewater sludge from the Former Sludge Settling Tank (SWMU No. 9). The sludge was reportedly returned to the Aeration Basin (SWMU No. 7), while the wastewater was gravity-fed back to the Clarifier (SWMU No. 8), prior to discharge to the Mobile POTW. The unit was used for only a few months until the press was found to be ineffective. The unit appeared to have good integrity at the time of the VSI. The cleanup procedures for the unit after deactivation are not known.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit managed sludge and wastewater which may have contained any of the raw materials and chemical intermediate products found at the facility.

RELEASE PATHWAYS:

Air (N)

Surface Water (N)

Soil (L)

Ground Water (N)

Subsurface Gas (N)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases or visual evidence of releases.

RECOMMENDATIONS:

No Further Action

RFA Phase II Sampling RFI Necessary

Project Name: Kay-Fries

Theodore, Alabama

Page 23 of 51

REFERENCES: 63, 164

COMMENTS:

Provide information on unit cleanup procedures after deactivation. If sludge remains in the unit, it should be removed and placed in the Aeration Basin or disposed offsite.

Project Name: Kay-Fries

Theodore, Alabama

Page 24 of 51

SWMU NUMBERS: 11, 12, 13 PHOTOGRAPH NUMBERS: 1-13 and 1-13A

NAME: Elementary Neutralization System

(A) Holding Tank (Tank No. 310) SWMU No. 11

- (B) Ammonia Steam Stripping Column (Unit T202) SWMU No. 12
- (C) Neutralization Tank (Tank No. 310) SWMU No. 13

TYPE OF UNIT: Wastewater Treatment System

PERIOD OF OPERATION: September 1986 to Present

PHYSICAL DESCRIPTION AND CONDITION:

This outside system consists of two carbon steel tanks (SWMU Nos. 11 and 13), and an Ammonia Steam Stripper Column (SWMU No. 12) which are located in the central process area of the facility. The above-ground vertical tanks are approximately 2,000 gallons each and are located on concrete pads which are bermed and which appeared to be in good condition. The tanks are each approximately 12 feet high and 8 feet wide and are supported by four steel support legs approximately 3.5 feet high. The tanks are identified by the facility as Tank 310 (SWMU No. 11), used as a holding tank, and Tank 311 (SWMU No. 13), which is the neutralization tank. The tanks are located under steel piping in an open-sided building.

The Ammonia Steam Stripper Column (SWMU No. 12) is an above-ground vertical unit approximately 4 inches in diameter and 20 feet long. The stripper column is constructed of stainless steel and is located on the same concrete pad as the two tanks. The stripper column is used to strip organic vapors (both ammonia and cyanide). The vapors are then sent to the Former Hazardous Waste Incinerator for incineration (SWMU No. 19).

Project Name: Kay-Fries

Theodore, Alabama

Page 25 of 51

The Holding Tank, (Tank No. 310) receives caustic wastewater with a pH of 9 to 10 from the Caustic Wash Unit in the Orthoester process area. The wastewater is held in the unit until it can be pumped into the Ammonia Steam Stripper Column.

Process modifications were initiated in 1986 so that the corrosive wastestream would be neutralized prior to discharge into the surface impoundments; thereby, the wastestream would no longer be hazardous (< pH 2.0). The neutralization is achieved by a batch process using a 25% caustic solution. The pH is raised to 7.0 ± 2.0, which is determined by testing with a calibrated pH meter. The neutralized non-hazardous wastestream is then discharged into the Equalization Basin (SWMU No. 5) via the Storm/Process Sewer System (SWMU No. 3). A schematic diagram of the elementary neutralization process is shown in Figure III-2.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit manages corrosive wastewaters (pH < 2.0), which may contain dilute concentrations of diethylbenzene, ammonia, acetonitrile and cyanides.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)

Ground Water (L) Subsurface Gas (L)

Project Name: Kay-Fries

Theodore, Alabama

III - 25

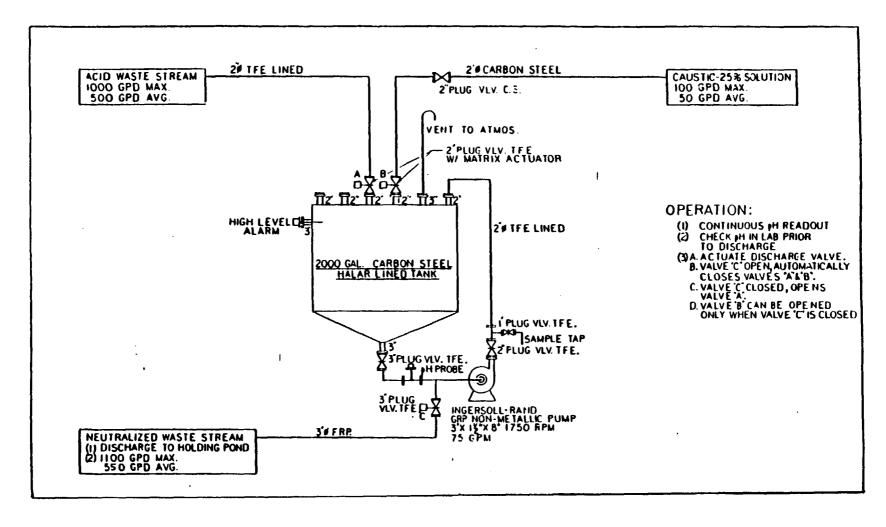


Figure III-2. Schematic Diagram of Neutralization Tank (SWMU No. 13).

Page 29 of 51

No Further Action RFA Phase II Sampling RFI Necessary RECOMMENDATIONS:

REFERENCES: 164, 166

COMMENTS: None

Project Name:

Kay-Fries Theodore, Alabama

Page 30 of 51

SWMU NUMBER:

15

PHOTOGRAPH NUMBER: 1-15

NAME:

Hazardous Waste Tank

TYPE OF UNIT:

Hazardous Waste Tank

PERIOD OF OPERATION: Present

PHYSICAL DESCRIPTION AND CONDITION:

This outside unit is located in the south-central part of the processing area north of the raw product storage area. The unit consists of a 7,500-gallon vertical steel tank which is located directly on a concrete pad which is bermed with a 2-foot concrete containment wall. The tank dimensions are approximately eight feet wide and ten feet high. The facility labels the tank as S-446. In addition, the tank is clearly labeled as a hazardous waste tank. The secondary concrete containment structure was in good condition and free of cracks and gaps. The hazardous waste liquid (EPA code D001) is shipped offsite to a facility located in Emelle, Alabama. Waste is shipped offsite before 90 days has elapsed, so that the facility can maintain generator status.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The liquid hazardous waste stored in the unit is classified as D001 and consists of an ignitable alcohol.

RELEASE PATHWAYS:

Air (L)

Surface Water (L)

Soil (L)

Ground Water (L)

Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases from the unit, and no evidence of release was noted during the VSI.

RECOMMENDATIONS:

No Further Action

RFA Phase II Sampling

RFI Necessary

Project Name:

Kay-Fries

Theodore, Alabama

Page 31 of 51

REFERENCES: 38, 164

COMMENTS: None

Project Name: Kay-Fries

Kay-Fries Theodore, Alabama Date: October 1990

i t

r

Page 33 of 51

No Further Action RECOMMENDATIONS: RFA Phase II Sampling

RFI Necessary

REFERENCES: 30, 164, 166

COMMENTS: None

Project Name: Kay-Fries
Theodore, Alabama Date: October 1990

Page 34 of 51

SWMU NUMBER: 17 PHOTOGRAPH NUMBER: No Photograph

NAME: Former Equalization Basin Sludge/

Liner Storage Site

TYPE OF UNIT: Container Storage Area

PERIOD OF OPERATION: 1983

PHYSICAL DESCRIPTION AND CONDITION:

The unit reportedly was located within a diked area in an unknown location at the facility. The storage area was of unknown dimensions, and was used to temporarily store the PVC liner and sludge from the Equalization Basin (SWMU No. 5). The sludge was reportedly stored in drums, prior to its disposal (along with the liner) by Chemical Waste Management at Emelle, Alabama. It is unknown if the drums were stored on pallets or directly on the soil. The unit was not examined during the VSI due to the uncertainty of facility representatives regarding the unit's location.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit managed a PVC liner and wastewater sludge which may have contained any of the raw materials and/or chemical intermediate products found at the facility.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)

Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases from the unit. The unit was not examined during the VSI.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ()

RFI Necessary (

Project Name: Kay-Fries Date: October 1990

Page 35 of 51

REFERENCES: 14

COMMENTS: The facility should determine the unit location, and provide this information, along with the quantity of drums stored and the date of waste removal (and unit closure), to the Agency.

Project Name: Kay-Fries

Theodore, Alabama

Page 36 of 51

SWMU NUMBER:

18

PHOTOGRAPH NUMBER: 1-24

NAME:

Venturi Scrubber

TYPE OF UNIT:

Air Pollution Control Equipment

PERIOD OF OPERATION: January 1980 to Present

PHYSICAL DESCRIPTION AND CONDITION:

This unit is located in an open-sided building in the central part of the facility in the process area. The unit is a small, three-inch Ametek Type 7019 Venturi scrubber located above the alcohol/product processing tank. The unit is constructed of steel and is approximately 15 inches high and 12 inches in diameter. The unit operates similarly to other types of Venturi scrubbers (i.e., gases and vapors are injected into the unit, where they are subject to a high velocity liquid spray which scrubs the vapors). The unit is 99% efficient and will handle 30 cubic feet per minute. The unit weighs approximately 20 pounds.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The waste managed by the unit is alcohol vapors from the alcohol/product processing tank.

RELEASE PATHWAYS:

Air (L)

Surface Water (L)

Soil (L)

Ground Water (L)

Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

The unit is designed and permitted to manage gases and vapors released from the alcohol/product processing tank.

RECOMMENDATIONS:

No Further Action

(X)

RFA Phase II Sampling

()

RFI Necessary

(

REFERENCES: 164, 166

Project Name: Kay-Fries

Theodore, Alabama

Page 37 of 51

COMMENTS:

Air emissions from the unit are regulated under the jurisdiction of ADEM and the Mobile County Board of Health.

Project Name: Kay-Fries
Theodore, Alabama

Page 38 of 51

SWMU NUMBERS: 19, 20 and 21 PHOTOGRAPH NUMBERS: 1-9 and 1-25

NAME: Former Hazardous Waste Incinerator System

(1) Incinerator (SWMU No. 19)

(2) Waste Heat Boiler (SWMU No. 20)(3) Caustic Scrubber (SWMU No. 21)

TYPE OF UNIT: Hazardous Waste Incinerator

PERIOD OF OPERATION: January 1981 to Present*

PHYSICAL DESCRIPTION AND CONDITION:

These outside units are located in the western part of the facility, south of the Equalization Basin (SWMU No. 5) and the Aeration Basin (SWMU No. 6). The Incinerator (SWMU No. 19) and Waste Heat Boiler (SWMU No. 20) are located on a 40-foot by 30-foot concrete pad which is shared with the Steam Boilers. The Caustic Scrubber (SWMU No. 21) is located just south of the concrete pad. The incinerator system was previously used to burn hazardous waste. When liquid waste alcohol (D001) was burned in the system, methylchloride and ethyl chloride were generated. The Caustic The Caustic Scrubber was used to prevent the formation of HCl when emissions contacted the atmosphere. However, the units are no longer used for incineration of hazardous waste, and have been closed in accordance with a closure plan approved by ADEM in early 1990. The units, especially the Waste Heat Boiler, may at times still be used for the generation of steam using natural gas. The present capacity of the Boiler is 7,500 pounds of steam per hour.

The Incinerator (SWMU No. 19) is located on the concrete pad which also contains the Steam Boilers. The unit is constructed of steel, and is approximately 15 feet long and 5 feet in diameter. The unit is a dual-chamber unit that can burn gaseous- and liquid-phase wastes. The dual chamber was necessary in order to provide greater efficiency. As was mentioned, the unit has been closed under an approved closure plan and is no longer being used to burn hazardous wastes.

The Waste Heat Boiler (SWMU No. 20) is an above-ground boiler constructed of steel and is cylindrical in shape. The unit is approximately 12 feet long and 5 feet in diameter and is supported

Project Name: Kay-Fries

Theodore, Alabama

Page 39 of 51

on top of six legs which are approximately 8 inches high. The unit is now used occasionally to burn natural gas. The unit is located on the concrete pad adjacent to the Incinerator.

The Caustic Scrubber (SWMU No. 21) is located immediately south of the concrete pad which contains the Former Hazardous Waste Incinerator System (SWMU Nos. 19 and 20) and the Steam Boilers. The outside unit is a steel structure approximately 25 feet high and 6 feet in diameter. The unit has an associated emission stack which is approximately 35 feet high. The unit is located directly on a concrete pad which is bermed. The concrete pad is approximately 15 feet by 15 feet.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit managed organic liquid wastes (D001) produced during the manufacturing of orthoesters and organo-functional silanes. Auxiliary natural gas was used when hazardous waste was burned to increase the BTU value. The unit ceased incineration of hazardous wastes in 1986. The Incinerator (SWMU No. 19) and the Waste Heat Boiler (SWMU No. 20) are presently being used to burn organic vapors in accordance with the air permit. The unit was used to generate steam for the plant's use.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)

Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There was no documented releases from the unit, and no evidence of prior releases were noted during the VSI.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ()
RFI Necessary ()

REFERENCES: 35, 51, 103, 164, 166

Project Name: Kay-Fries Date: October 1990

Theodore, Alabama

Page 40 of 51

COMMENTS:

Air emissions from the unit are regulated under the jurisdiction of ADEM and the Mobile County Board of Health.

*The unit is operational, but ceased managing hazardous waste in 1986.

Project Name: Kay-Fries

Theodore, Alabama

Page 41 of 51

SWMU NUMBER:

22

PHOTOGRAPH NUMBERS: 1-16 and 1-17

NAME:

Drum Rinse Unit

TYPE OF UNIT:

Open Tank Type Structure

PERIOD OF OPERATION: May 1990 to Present

PHYSICAL DESCRIPTION AND CONDITION:

This outside unit is located in the central part of the facility. The unit is an above-ground, five foot by five foot, square steel structure, approximately three feet high, with a water nozzle in the center. Empty drums are placed over the nozzle structure in an inverted position and pressurized water is forced into the drum. The steel structure of the unit sits directly on a concrete pad which is bermed. Inside the drum rinse unit is a steel grate which serves to hold the inverted drum into place while the drum is being washed. Rinsate from the drum rinse unit flow directly to the Storm/Process Sewers (SWMU No. 3). During the VSI, solid residuals were noted in the bottom of the unit. The handling procedures for these residuals had not been determined by the facility at the time of the VSI since the unit had only been operational for approximately three months.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit is used to rinse empty 55-gallon drums which contained raw chemicals or waste. Any raw chemical drums which are emptied will be rinsed prior to sending offsite.

RELEASE PATHWAYS:

Air (L)

Surface Water (L)

Soil (L)

Ground Water (L)

Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases from the unit, and no evidence of releases was noted during the VSI.

Project Name: Kay-Fries

Theodore, Alabama

Page 42 of 51

No Further Action RECOMMENDATIONS: RFA Phase II Sampling

RFI Necessary

REFERENCES: 164, 166

COMMENTS:

During the inspection it was noted that sludge (approximately 4-6 inches) had accumulated in the bottom of the Drum Rinse Unit (SWMU No. 21). Since the unit has only been operational for 3 months it seems unlikely that that amount of sludge should be present. The accumulated sludge should be sampled to determine the presence of hazardous constituents and to evaluate a proper method of disposal.

Project Name: Date: October 1990 Kay-Fries

Theodore, Alabama

Page 43 of 51

SWMU NUMBER:

23

PHOTOGRAPH NUMBER: 1-22

NAME:

Former Sludge Disposal Site

TYPE OF UNIT:

Landfill

PERIOD OF OPERATION: September 1983 - October 1986

PHYSICAL DESCRIPTION AND CONDITION:

The unit is located in the far southwestern part of the facility. The unit consisted of a below-grade depression which was approximately 85 feet by 85 feet and 6 to 8 feet deep. Waste sludges, along with the clay and synthetic liners from the remediation and cleanup of the Aeration Basin (SWMU No. 7), were disposed in the The waste sludges and associated clean-up material were placed directly into the unit and were covered with a native soil cover of approximately 10 to 12 inches. During a joint site visit by ADEM and EPA on June 12, 1986, this unit was identified as a SWMU. Waste material in this unit was removed under supervision of EPA and ADEM, and was disposed at a hazardous waste site in Emelle, Alabama. The area has been clean closed in accordance with both agencies. Presently, the unit is undergoing construction, with a new isophorone derivatives chemical processing facility planned for the area.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit managed waste sludges, clay and synthetic liner from the Aeration Basin clean-up. The material had a high ammonia content. Soil sampling performed in October 1986 showed no hazardous constituents. However, the facility decided to remove waste materials contained in the unit.

RELEASE PATHWAYS:

Air (L) Surface Water (L)

Soil (L)

Ground Water (L)

Subsurface Gas (L)

Kay-Fries Project Name:

Theodore, Alabama

Page 44 of 51

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There was no evidence of release during the VSI. The wastes disposed in the unit had been removed from the site and taken to a hazardous waste disposal site in Emelle, Alabama. The unit was closed under an approved closure plan and several soil samples were taken at various depths until the closure performance standards were met.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ()
RFI Necessary ()

REFERENCES: 72, 79, 164, 166

COMMENTS: Hist

Historic release potentials to soil and groundwater were moderate. All waste was removed to

closure performance standards.

Project Name: Kay-Fries

Theodore, Alabama

Page 46 of 51

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ()

RFI Necessary (

REFERENCES: 72, 79, 164

COMMENTS: None

Project Name: Kay-Fries

Theodore, Alabama

Page 47 of 51

SWMU NUMBER:

25

PHOTOGRAPH NUMBER:

NAME:

Former Cyanide Stripper Column Site

TYPE OF UNIT:

Wastewater Treatment

PERIOD OF OPERATION: 1981 to 1986

PHYSICAL DESCRIPTION AND CONDITION:

The Former Cyanide Stripper Column Site is located in the southeast section of the orthoester process area, which is in the west central portion of the facility. The unit which was of unknown capacity/dimensions received caustic wastewater from the caustic wash unit in the process area. The unit removed cyanide, along with minor amounts of ammonia and non-product organics, as vapor from the wastewater. Muriatic acid was added to the unit with the influent wastewater to lower the pH of the wastestream and facilitate cyanide removal. Wastewater leaving the unit via the Storm/Process Sewers (SWMU No. 3) had a pH of approximately 2.0. The unit had been removed prior to the VSI. Staining was noted during the VSI on the concrete support which held the unit. The support stands on a concrete pad under the roof of an open-sided building.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit managed caustic wastewater which contained cyanide, ammonia and minor organics.

RELEASE PATHWAYS:

Air (N)

Surface Water (N)

Soil (N)

Ground Water (N)

Subsurface Gas (N)

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases from the unit. Staining was noted during the VSI on the concrete support for the unit. Releases from the unit would have been managed by the Process Area Floor Trenches (SWMU No. 1).

RECOMMENDATIONS:

No Further Action

(X)

Project Name: Kay-Fries

Theodore, Alabama

Page 48 of 51

RFA Phase II Sampling ()
RFI Necessary ()

REFERENCES: 168

COMMENTS: None

Project Name: Kay-Fries

Kay-Fries Theodore, Alabama

Page 49 of 51

SWMU NUMBER:

AOC A

PHOTOGRAPH NUMBER: 1-8

NAME:

Runoff Ditch System

TYPE OF UNIT:

Stormwater Transfer Unit

PERIOD OF OPERATION: 1981 to Present

PHYSICAL DESCRIPTION AND CONDITION:

The Runoff Ditch System is located throughout the facility as shown in Figure III-3. The unit consists of a network of unlined, unbermed, below-grade ditches used to collect runoff from outside the process areas at the facility. The ditches are typically two feet deep and six feet wide. The network runs along the facility railroad tracks where product/raw material spills away from the Rail Loading/Unloading Area (SWMU No. 2) may enter the unit. There is also a ditch adjacent to the Equalization Basin (SWMU No. 5), where overtopping of the basin due to heavy rainfall may discharge contaminated wastewater to the unit.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The unit manages runoff from non-process areas of the facility. The unit may also receive wastewater from overtopping of the Equalization Basin which could contain any of the raw materials or products found at the facility, and raw material/product leaks or spills from railcars.

RELEASE PATHWAYS:

Air (L-M) * Surface Water (L) Soil (L-M) *

Ground Water (L-M) * Subsurface Gas (L-M) *

HISTORY AND/OR EVIDENCE OF RELEASE(s):

There are no documented releases from the unit and no evidence of releases was noted during the VSI.

RECOMMENDATIONS:

No Further Action ()
RFA Phase II Sampling (X)

RFI Necessary

(

Project Name: Kay-Fries

Theodore, Alabama

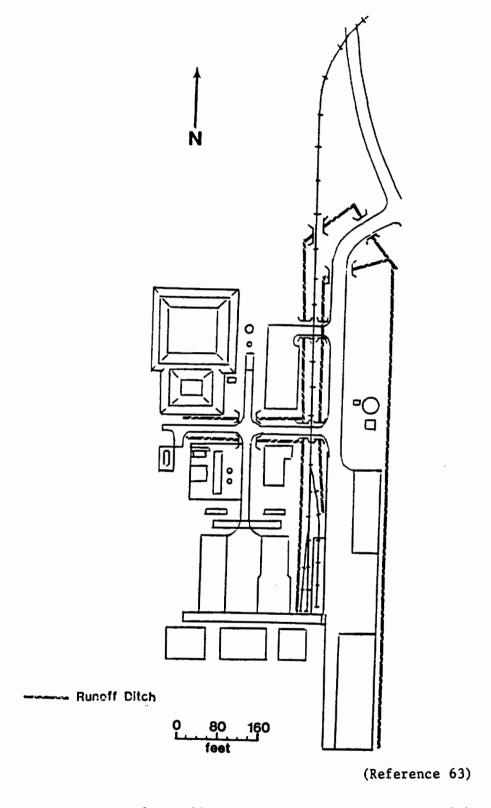


Figure III-3. Location of Runoff System, Kay-Fries, Theodore, Alabama.

Page 51 of 51

REFERENCES: 63, 164

COMMENTS:

* Release potentials to air, soil and ground water, along with subsurface gas generation potential, would be moderate should releases occur from the Equalization Basin or along the railroad tracks. Soil sampling near the Equalization Basin is recommended because overtopping of the basin may have released hazardous constituents to the unit.

Project Name: Kay-Fries

Theodore, Alabama

IV. SUMMARY LISTS

The following pages provide lists of all SWMUs and AOCs, SWMUs and AOCs requiring no further action, SWMUs that are RCRA-regulated units, SWMUs and AOCs requiring RFA Phase II sampling, and SWMUs and AOCs requiring an RFI.

LIST OF ALL SWMUS AND AOCS

SWMU No.	SWMU Name
1.	Process Area Floor Trenches
2.	Rail Loading/Unloading Area with Floor Trench
3.	Storm/Process Sewer System
4.	Lift Sump
5.	Equalization Basin
6.	Wastewater Mix Basin
7.	Aeration Basin
8.	Clarifier
9.	Former Sludge Settling Tank
10.	Former Sludge Filter Press
11 13.	Elementary Neutralization System
14.	Cyad Wastewater Tank
15.	Hazardous Waste Tank
16.	Container Storage Area
17.	Former Equalization Basin Sludge/Liner Storage Site
18.	Venturi Scrubber
19.	Former Hazardous Waste Incinerator SystemCaustic Scrubber
20.	Former Hazardous Waste Incinerator SystemIncinerator
21.	Former Hazardous Waste Incinerator SystemWaste Heat Boiler
22.	Drum Rinse Unit
23.	Former Sludge Disposal Site
24.	Former Construction Debris Disposal Site
25.	Former Cyanide Stripper Column
AOC	AOC Name
AOC A	Runoff Ditch System

LIST OF ALL SWMUS REQUIRING NO FURTHER ACTION

SWMU No.	SWMU Name					
1.	Process Area Floor Trenches					
2.	Rail Loading/Unloading Area with Floor Trench					
3.	Storm/Process Sewer System					
4.	Lift Sump					
6.	Wastewater Mix Basin					
7.	Aeration Basin					
8.	Clarifier					
9.	Former Sludge Settling Tank					
10.	Former Sludge Filter Press					
11 13.	Elementary Neutralization System					
14.	Cyad Wastewater Tank					
15.	Hazardous Waste Tank					
16.	Container Storage Area					
17.	Former Equalization Basin Sludge/Liner Storage Site					
18.	Venturi Scrubber					
19.	Former Hazardous Waste Incinerator SystemCaustic					
	Scrubber					
20.	Former Hazardous Waste Incinerator SystemIncinerator					
21.	Former Hazardous Waste Incinerator SystemWaste Heat					
	Boiler					
23.	Former Sludge Disposal Site					
24.	Former Construction Debris Disposal Site					
25.	Former Cyanide Stripper Column					
AOC A	Runoff Ditch System					
	-					

LIST OF ALL SWMUS AND AOCS REQUIRING RFA PHASE II SAMPLING

SWMU No.	<u>SWMU Name</u>
5. 22.	Equalization Basin Drum Rinse Unit
AOC No.	AOC Name
A	Runoff Ditch System

LIST OF SWMUS AND AOCS REQUIRING AN RFI

There are no units which require an RFI at this facility.

V. SUGGESTED SAMPLING STRATEGY

Unit No.		Operational Dates	Suggested Sampling	Evidence of Releases(Yes/No)
5	Equalization	1981 to	The units were used to	Yes
~	Basin	Present	homogenize process wastewaters and process	
7	Aeration Basin		area spills. Releases to soil and groundwater occurred from the units when the original PVC liners broke in 1983. The acidic wastewaters which originally entered the units are now neutralized in the pro- cess area. Therefore, the units no longer manage the corrosive (D002) waste for which they were originally permitted. The Basins have been approved by ADEM as clean-closed units. However, the clean closure has not been certified. Phase II sampling is recom mended for these units to verify that they do not ma hazardous wastes or constituents. Analyze the influent wastewaters for the unit for volatile organics, base neutrals and methanol.	e a- anage
21	Drum Rinse Unit	March 1990 to Present	The unit is used to clean drums which contain any of the raw materials or products found at the facility. A significant residue pile was present in the bottom of the unit during the VSI. Phas II sampling is suggested at this unit. A residue sample should be collected with TCLP analyses (per	

Unit No.	<u>Unit Name</u>	Operational Dates	Suggested Sampling	Evidence of Releases (Yes/No)
	Drum Rinse Unit (Con't.)		FR 3/29/90) conducted, excluding pesticides, to determine if hazardous wastes or constituents are managed by the unit.	
AOC	Runoff Ditch System	1981 to Present	The unit manages runoff from non-process areas at the facility, as well as discharges from the Equalization and Aeration Basins due to overtopping, and spills/leaks from railcars along the facility rails. Soil sampling is recommended adjacent to the Equalization Basin, with TCLP analyses (per FR 3/29/90) conducted, excluding pesticides, to determine if hazardous wastes or constituents are managed by the unit.	No

VI. REFERENCES

RCRA FILES

1980

- 1. Kay-Fries, Correspondence to Mr. Dan Cooper, ADEM, Re: Alabama Current Solid Waste Disposal Regulations, March 24, 1980.
- Allen, Donald, Correspondence to Mr. Bernard Cox, ADEM, Re: Wastewater Discharge from Silane Production Unit, April 23, 1980.
- 3. Emmett, D., Kay-Fries, Correspondence to Cozart, R., U.S. EPA Region IV, Re: Submission of Part A Permit Application, November 18, 1980.

1981

4. Opdyke, Edward, Kay-Fries, Correspondence to Mr. Bernard Cox, ADEM, Re: Approval to Postpone Installation of Ground-Water Monitoring Wells, October 26, 1981.

1982

- 5. Henderson, D., Chester Engineers, Correspondence to Criscione, G., Kay-Fries, Re: Clarifier Sludge Analyses, March 11, 1982.
- 6. Opdyke, E., Correspondence to Cox, B., ADEM, Re: Revision of Part A Permit Application, December 15, 1982.

- 7. Kay-Fries, Correspondence to Mr. John A. Poole, Water Improvement Commission, February 3, 1983.
- 8. Criscione, G., Kay-Fries, Correspondence to J. Poole, Re: Exceedance of Discharge Limit, February 11, 1983 and February 3, 1983.
- Moser, P., Geological Survey of Alabama, Correspondence to J. Honeycutt, Re: Installation of Monitoring Wells, March 28, 1983.
- 10. Lance, R., Kay-Fries, Correspondence to Mr. J. Poole, Re: Analysis of Outfall, April 6, 1983.
- 11. Kay-Fries, Correspondence to Mr. J. Poole, Re: Tears in Aeration Basin Lines, August 3, 1983.

- 12. Lance, Robert, Kay-Fries, Correspondence to Mr. Mike Smith, ADEM, Re: Ground-Water Sampling, August 30, 1983.
- 13. Kay-Fries, Correspondence to Mr. J. Poole, Water Improvement Commission, Re: Outfall Discharge Sampling, September 7, 1983.
- 14. Memorandum, From M.C. Smith, ADEM, to B. Cox, Re: Holding Pond Liner Removal, September 29, 1983.
- 15. Kay-Fries, Correspondence to Mr. J. Poole, Water Improvement Commission, Re: Outfall Discharge Sampling, October 10, 1983.
- 16. Kay-Fries, Correspondence to Ms. S. Massey, Water Improvement Commission, Re: SPCC Plan, November 3, 1983.
- 17. Lance, Robert, Day-Fries, Correspondence to C. Fleming, ADEM, Re: Quarterly Ground-Water Sampling, December 8, 1983.

- 18. Lance Jr., R., Kay-Fries, Correspondence to Charles Fleming, ADEM, Re: Third Quarterly Ground-Water Monitoring, March 8, 1984.
- 19. Criscione, G. Correspondence to Fleming, C., Re: New Product Line Hexamethyl D: Silizane (HMDS), June 15, 1984.
- 20. Criscione G., Correspondence to C. Fleming, Re: Kay-Fries Results of First Year's Ground-Water Monitoring, June 28, 1984.
- 21. Criscione, G., Correspondence to Fleming, C., ADEM, Re: Fourth Quarterly Monitoring, June 28, 1984.
- 22. Criscione. G., Correspondence to Fleming, C., ADEM, Re: Overflow of Ponds, August 20, 1984.
- 23. Criscione, G., Correspondence to Fleming, C., ADEM, Re: Waste Generator Report, October 10, 1984.
- 24. ADEM Ground-Water Monitoring Report, October 23, 1984.
- 25. Tremblay, J., Harding-Lawson, to Smith, H., U.S. EPA Region IV, Re: Compliance Inspection Report, October 30, 1984.
- 26. Kay-Fries, Correspondence to Ramey, D., Re: Sampling and Analysis of RCRA Wells, October 31, 1984.
- 27. Hydrologist, South Unit, U.S. EPA Region IV, to Spagg, B. Re: Trip Report to Kay-Fries by ADEM, November 14, 1984.

- 28. Wood, H., Memorandum to Cox, B., Re: Kay-Fries Preliminary Part B Meeting, November 16, 1984.
- 29. Bearman, S., Kay-Fries, Correspondence to Harvanek, J., Re: Revision of Part A, November 20, 1984.
- 30. Kay-Fries, Re: RCRA Permit Application for Kay-Fries, Alabama, Inc. Excerpts, December 3, 1984.

- 31. Criscione, G., Correspondence to Zora, R., ADEM, Re: Waste Generator Report, January 7, 1985.
- 32. Criscione, G., Correspondence to Downey, J., Re: EPA I.D. Numbers Issued to Kay-Fries, January 8, 1985.
- 33. Matthew, S., Memorandum to Holland, B., Re: Ground-Water Monitoring Program at Kay-Fries, January 14, 1985.
- 34. Cox, B., ADEM, Correspondence to McCurry, D., U.S. EPA Region IV, Re: EPA I.D. Number, January 15, 1985.
- 35. Maggio, T., Kay-Fries, Inc., Correspondence to Scarborough, J., U.S. EPA Region IV, Re: Potential Releases from SWMUs, January 22, 1985.
- 36. Bearman, S., Kay-Fries, Inc., Correspondence to Scarborough, J., U.S. EPA Region IV, Re: Part B Application, January 25, 1985.
- 37. Cox, B., ADEM, Re: Warning Letter to Patrick, C., Kay-Fries, February 22, 1985.
- 38. Mason, F., Memorandum to Cox, B., Re: Kay-Fries Part B Review, March 21, 1985.
- 39. Matthews, S., WCS, Memorandum to Holland, B., Re: Ground-Water Review of Part B Application, April 1, 1985.
- 40. Cox, B., ADEM, Correspondence to Patrick, L., Kay-Fries, Re: Ground-Water Monitoring, April 3, 1985.
- 41. Bearman, S., Kay-Fries, Correspondence to Scarborough, J., U.S. EPA Region IV, Re: Transfer of Container Storage Area, April 10, 1985.
- 42. Ford, R., ADEM, to File, Re: Ground-Water Monitoring Inspection, June 6, 1985.
- 43. Hains, C., Hains Hydrologist, Inc., Correspondence to Paxton, M., Tom Joiner & Associates, Re: Ground-Water Well Installation, July 16, 1985.

- 44. Graves, Graves Well Drilling Co., Correspondence to Paxton, M., Tom Joiner & Associates, Re: Drilling Methods, July 22, 1985.
- 45. Bearman, S., Kay-Fries, Correspondence to McCurry, D., Re: Exposure Information Report, August 6, 1985.
- 46. Paxton, M., Tom Joiner & Associates, Correspondence to Opdyke, E., Re: Ground-Water Program, August 9, 1985.
- 47. Devine, T., Director, ADEM, Re: Compliant and Compliance Order to Maggio, T., Kay-Fries, August 20, 1985.
- 48. Mason, F., Memorandum to Cox, B., Re: Show Cause Not to Fine \$10,000, September 25, 1985.
- 49. Record of Communication Regarding Informal Conference between EPA and Kay-Fries, September 24, 1985.
- 50. Joiner, T., Tom Joiner and Associates, Memorandum to File, Re: September 27, 1985 Conference Call Regarding Monitoring Well System, September 27, 1985.
- 51. Bearman, S., Kay-Fries, Inc., Correspondence to Raven, J., EPA Region IV, Determination of Status of Incinerator, October 3, 1985.
- 52. Cox, B., ADEM, Correspondence to Mitchell, D., Irvington Civic Associates, Re: Kay-Fries Closure, October 9, 1985.
- 53. U.S. EPA Region IV, Preliminary Assessment/Site Investigation (PA/SI) for SWMUs Checklist, October 18, 1985.
- 54. Ground-Water Monitoring Test Results, October 22, 1985.
- Paxton, M., Tom Joiner & Associates, Correspondence to Mason, F., ADEM, Re: Sampling of Shallow Wells, November 4, 1985.
- 56. U.S. EPA Region IV, Preliminary Assessment/Site Investigation (PA/SI) for SWMUs Checklist, November 8, 1985.
- 57. Bearman, S., Kay-Fries, Correspondence to Von Sprecker, J., Commissioner, City of Mobile Water and Sewage Board, Re: Discharge Limits, November 20, 1985.
- 58. Scarborough, J., U.S. EPA Region IV, Correspondence to Bearman, S., Kay-Fries, Re: Part B Application Review, November 27, 1985.
- 59. Addition to Monitor Well Program for Kay-Fries Chemical Plant, Kay-Fries Alabama, Inc., Prepared by Tom Joiner and Associates, Inc., Consulting Geologists and Engineers, November 1985.

- 60. MacGregor, J., Legal Counsel, Correspondence, Re: Request to Freedom of Information Offices, December 10, 1985.
- 61. Note: Summary of History at Kay-Fries, December 11, 1985.

- 62. Scarborough, J., U.S. EPA, Correspondence to Bearman, S., Kay-Fries, Re: Closure Certification, January 14, 1986.
- 63. Bearman, S., Kay-Fries, Correspondence to Scarborough, J., U.S. EPA Region IV, Re: Revision of Part B Permit Application in Response to NODs, January 16, 1986.
- 64. Bearman, S., Kay-Fries, Correspondence to Scarborough, J., U.S. EPA Region IV, Re: Correction to Part B Permit Revision 2, February 18, 1986.
- 65. Mason, F., Memorandum to Cox, B., Re: Part B Comments, Second NOD, March 10, 1986.
- Bearman, S., Kay-Fries, Correspondence to Cox, B., ADEM, Re: Surface Impoundment Closure, March 31, 1986.
- 67. Copper, D., ADEM, Re: Notice of Violation to Kay-Fries, to Bearman, S., April 3, 1986.
- 68. Patrick, L., Kay-Fries, Correspondence to Scarborough, J., U.S. EPA Region IV, Re: Annual Ground-Water Monitoring Report, April 9, 1986.
- 69. Scarborough, J., U.S. EPA Region IV, Correspondence to Bearman S., Kay-Fries, Re: Closure, May 1, 1986.
- 70. Bearman, S., Kay-Fries, Correspondence to Cooper, D., ADEM, Re: Notice of Violations, May 15, 1986.
- 71. Record of Communication, Re: Informal Meeting on Closure, June 16, 1986.
- 72. Trip Report on Kay-Fries, Inc., Re: Site Inspection on June 12, 1986, to Spagg, B., U.S. EPA Region IV, June 23, 1986
- 73. Wood, H., ADEM, Memorandum to Cox, B., ADEM, Re: June 16, 1986 Meeting Summary, June 25, 1986.
- 74. Bearman, S., Kay-Fries, Inc., Correspondence to Scarborough, J., U.S. EPA Region IV, Re: Unusual Ground-Water Well Elevations, June 26, 1986.
- 75. Scarborough, J., U.S. EPA Region IV, Correspondence to Bearman, S., Kay-Fries, Re: Site Visit, July 10, 1986.

- 76. Bearman, S., Kay-Fries, Correspondence to Steiner, J., U.S. EPA Region IV, Re: Statutes of Waste in Surface Impoundments, July 15, 1986.
- 77. Bearman, S., Kay-Fries, Correspondence to Cox, B., ADEM, Re: Submission of Amended Closure Plan, October 10, 1986.
- 78. Scarborough, J., U.S. EPA Region IV, Correspondence to Bearman, S., Kay-Fries, Re: Review of Closure Plan, September 1986.
- 79. Baya, E., Thompson Engineering Testing, Re: Cyanide and Acetonitrile Analysis of Soil Samples, December 23, 1986.
- 80. Cox, B., ADEM, Correspondence to Bearman, S., Kay-Fries, Re: Revised Closure Plan, December 31, 1986.

<u> 1987</u>

- 81. Patrick, L, Kay-Fries, Correspondence to Cox, B., ADEM, Re: Ground-Water Monitoring Data, February 19, 1987.
- 82. Baya, E., Thompson Engineering, Correspondence to Patrick, L., Re: Closure Sampling Program, March 28, 1987.
- Patrick, L., Kay-Fries, Correspondence to Cox, B., ADEM, Re: Warning Letter to Patrick, L., Kay-Fries, August 28, 1987.
- 84. Baya, E., Thompson Engineering, Correspondence to Patrick, L., Kay-Fries, Re: Sampling of Monitoring Wells for Closure Plan, September 4, 1987.
- 85. Bearman, S., Kay-Fries, Correspondence to Cox, B., ADEM, Re: Closure Plan, September 24, 1987.
- 86. Bearman, S., Kay-Fries, Correspondence to Scarborough, J., U.S. EPA Region IV, Re: Closure Certification, September 24, 1987.
- 87. Kay-Fries, Alabama, Inc., Comprehensive Ground-Water Inspection, November 9-10, 1987.
- 88. Cox, B., ADEM, Correspondence to Bearman, S., Kay-Fries, Re: Closure Certification, November 12, 1987.
- 89. Baya, E., Thompson Engineering Testing, Inc., Correspondence to Patrick, C., Kay-Fries, Re: Equalization Basin Influent Monitoring, December, 2, 1987.
- 90. Bearman, S., Kay-Fries, Correspondence to Cox, B., ADEM, Re: Surface Impoundment Certification, December 4, 1987.

- 91. Bearman, S., Kay-Fries, Correspondence to Cox, B., ADEM, Re: Response to March 3, 1988 ADEM Letter, March 18, 1988.
- 92. Swindel, D., Memorandum to Cox, B., ADEM, Re: Annual Ground-Water Report, April 4, 1988.
- 93. Swindel, D., Memorandum to Cox B., ADEM, Re: Review of Surface Impoundment Closure, May 6, 1988.
- 94. Swindel, D., Memorandum to Cox, B., ADEM, Comprehensive Ground-Water Evaluation for Kay-Fries, May 9, 1988.
- 95. Cox, B., ADEM, Correspondence to Bearman, S., Kay-Fries, Re: Closure Certification, May 19, 1988.
- 96. Sciple, J., Savannah Labs, Correspondence to Patrick, L., Kay-Fries, Re: Analysis of Ground Water, May 31, 1988.
- 97. Baya, E., Thompson Engineering, Correspondence to Patrick, L., Kay-Fries, Re: Statistical Evaluation of April 1988 Ground-Water Data, June 10, 1988.
- 98. Baya, E., Thompson Engineering, Correspondence to Patrick, L., Kay-Fries, Re: Statistical Evaluation of Ground Water, August 3, 1988.
- 99. Cox, B., ADEM, Correspondence to Patrick, C., Kay-Fries, Re: Notice of Violation, August 19, 1988.
- 100. Hall, S., U.S. EPA Region IV, Memorandum to Antley, U.S. EPA Region IV, Re: EPA Oversite of Kay-Fries, September 14, 1988.

- 101. Cox, B., ADEM, Correspondence to Patrick, L., Kay-Fries, Re: Letter of Violation, January 19, 1989.
- 102. Robertson, S., ADEM, Correspondence to Patrick L., Kay-Fries, Re: Notice of Violation, January 30, 1989.
- 103. Wnek, J., Kay-Fries, Correspondence to Cox, B., Re: Incinerator Closure, February 27, 1989.
- 104. Joiner, T., Joiner & Associates, Inc., Correspondence to Patrick, L., Kay-Fries, Re: Ground-Water Levels, March 2, 1989.
- 105. Patrick, L., Kay-Fries, Correspondence to Cox, B., ADEM, Re: Ground-Water Analysis, March 8, 1989.

- 106. Patrick, L., Kay-Fries, Correspondence to Cox, B., Re: 1988 Ground-Water Monitoring Annual Report, March 28, 1989.
- 107. Narramore, J., ADEM, Correspondence to Patrick, L., Re: Notice of Violation, May 2, 1989.
- 108. Swindel, D., ADEM, Memorandum to Cox, B., Re: Compliance Evaluation Inspection D, Kay-Fries, May 9, 1989.
- 109. Cox, B., ADEM, Correspondence to Patrick, L., Re: Meeting Concerning Clean Closure of Surface Impoundment, May 15, 1989.
- 110. Benante, J., Kay-Fries, Memorandum to Farmer, A., Re: RFA at Kay-Fries, October 24, 1989.
- 111. Behel, M., ADEM, Record of Communication with Ketcham, L., Re: Kay-Fries Clean Closure, November 15, 1989.
- 112. Farmer, A., U.S. EPA Region IV, Memorandum to Foster, B., Re: RFA at Kay-Fries, December 1, 1989.
- 113. Ketcham, L., U.S. EPA Region IV, West Record of Communication with Behel M., Re: RFA at Kay-Fries, December 7, 1989.

- 114. Wnek, J., Hüls America, Correspondence to Cox, B., Re: Clean Closure Certificate for Theodore Facility, January 11, 1990.
- 115. Anonymous, Review of Part 264 Clean Closure Requirement for the Hüls America Inc. Theodore, Alabama Facility, January 1990.
- 116. Whek, J., Hüls America, Correspondence to Cox, B., Re: Classification of Process Wastes from the Proposed Isophorone Derivatives Facility, February 20, 1990.
- 117. Cox, C., ADEM, Correspondence to Ketcham, L., Re: Clean-Closure Information for Facility U.S. EPA I.D. No. ALD 000 608 224, March 5, 1990.
- Peques, L., ADEM, Correspondence to Patrick, L., Kay-Fries, Re: ADEM Approval of Clean Closure of Incinerator and Surface Impoundments, March 29, 1990.
- 119. Dean, G., ADEM, Correspondence to Patrick, L., Re: State Indirect Discharge Permit, May 23, 1990.
- 120. Scarborough, J., U.S. EPA Region IV, Correspondence to Patrick, L., Kay-Fries, Re: Informing Kay-Fries of Scheduled Inspection, July 25, 1990.

No Date

- 121. Environmental Engineer, Memorandum to Lair, D., Re: Request for Sampling and Analysis at Kay-Fries, No Date.
- 122. Lance, R., Kay-Fries, Re: Hazardous Waste Management Plan, Theodore Facility, No Date.

AIR REFERENCES

1978

- 123. Permit to Construct or Modify an Air Contaminant Source #503-5016-0001, for Organic Chemical Process, issued by Mobile County Board of Health, Alabama to Kay-Fries, September 13, 1978.
- 124. Permit to Construct, #503-5016-0002; #503-5016,0003, for Boiler, issued by Mobile County Board of Health, to Kay-Fries, September 13, 1978.

1980

125. Permit to Construct, #503-5016-001, for Organic Chemical Process issued by Mobile County Health Department to Kay-Fries, January 1980.

126. Permit to Construct, #503-5016-8701 #503-5016-8702 #503-5016-8703 #503-5016-8704 #503-5016-8705 #503-5016-8706

for Storage Tanks, Issued by Mobile County Health Department to Kay-Fries, January 24, 1980.

- 127. Permit to Construct, #3503-5016-0004, for Incinerator for Disposal of Waste Alcohols, Issued by Mobile County Health Department to Kay-Fries, January 24, 1980.
- 128. Permit to Construct, #503-5016-0005, for Organic Chemical Process, Issued by Mobile County Health Department to Kay-Fries, January 24, 1980.

<u> 1981</u>

129. Temporary Permit to Operate, #503-5016-Y001, for Organic Chemical Process, Issued by State of Alabama Air Pollution Control Commission to Kay-Fries, May 8, 1981.

141. Air Permit, #503-5016-X013, for Roof Storage Tank, Issued by Alabama Department of Environmental Management to Kay-Fries, November 26, 1986.

<u> 1987</u>

- 142. Air Permit, #503-5016-X014, for Steam Boiler, Issued by Alabama Department of Environmental Management to Kay-Fries, January 22, 1987.
- 144. Air Permit, #503-5016-X016, for Roof Storage Tank, Issued by Alabama Department of Environmental Management to Kay-Fries, January 22, 1987.
- 145. Air Permit, #503-5016-X017, for Roof Storage Tank, Issued by Alabama Department of Environmental Management to Kay-Fries, January 22, 1987.
- 146. Air Permit, #503-5016-X018, for Roof Storage Tank, Issued by Alabama Department of Environmental Management to Kay-Fries, January 22, 1987.
- 147. Air Permit, #503-5016-X019, for Roof Storage Tank, Issued by Alabama Department of Environmental Management to Kay-Fries, January 22, 1987.
- 148. Air Permit, #503-5016-X020, for Process Unit, Issued by Alabama Department of Environmental Management to Kay-Fries, April 22, 1987.
- 149. Air Permit, #503-5016-X010, for Organic Chemical Process, Issued by Alabama Department of Environmental Management to Kay-Fries, July 22, 1987.

- 150. Air Permit, #503-5016-X012, for Fixed Roof Storage Tank, Issued by Alabama Department of Environmental Management to Kay-Fries, February 10, 1988.
- 151. Air Permit, #503-5016-X013, for Fixed Roof Storage Tank, Issued by Alabama Department of Environmental Management to Kay-Fries, February 10, 1988.
- 152. Air Permit, #503-5016-Z021, for Roof Storage Tank, Issued by Alabama Department of Environmental Management to Kay-Fries, February 10, 1988.

- 153. Air Permit, #503-5016-Z022, for Roof Storage Tank, Issued by Alabama Department of Environmental Management to Kay-Fries, February 10, 1988.
- 154. Air Permit, #503-5016-X020, for Process Unit, Issued by Alabama Department of Environmental Management to Kay-Fries, May 10, 1988.

- 155. Air Permit, #503-5016-Z004, for Organic Chemical Process, Issued by Alabama Department of Environmental Management to Kay-Fries, December 13, 1989.
- 156. Air Permit, #503-5016-X015, for Cyanoacetic Acid Process, Issued by Alabama Department of Environmental Management, to Kay-Fries, December 13, 1989.

MISCELLANEOUS REFERENCES

<u>1966</u>

- 157. Pierce, L.B. and Rogers, S.M., Surface Water in Southwestern Alabama, Geological Survey of Alabama Bulletin, No. 84, 1966, p. 182.
- 158. Davis, M.D., Ground-Water Levels in Alabama, Geological Survey of Alabama Circular, No. 105, p. 74.

1980

159. Soil Conservation Service, Soil Survey of Mobile County, Alabama, U.S. Department of Agriculture, 1980, p. 134.

1982

160. U.S. Geological Survey, Theodore Quadrangle--Topographic Map, Scale 1:24,000, 1982.

<u> 1984</u>

161. Hinkle, F., Ground-Water Resources of the Lower Tombigbee-Mobile River Corridor, Geological Survey of Alabama Circular, No. 115, 1984, p. 56.

1985

162. "Climate of Alabama" in Climate of the States, Gale Research, 1985, pp. 1-19.

163. Gillett, B., Shamburger, V.M. and Moore, J.D., Selected Wells and Springs in Southwestern Alabama, Geological Survey of Alabama, Map No. 201B, 1987 (Data Tables--70 p.).

<u> 1990</u>

- 164. VSI Logbook, July 30, 1990.
- 165. Telephone Conference Between J. Dreith, A.T. Kearney, L. Patrick, Kay-Fries, Re: SWMUs, August 13, 1990.
- 166. Telephone Conference Between J. Carloss, A.T. Kearney, and L. Patrick, Kay-Fries, Re: Wastewater Treatment System, August 27, 1990.
- 167. Telephone Conference Between J. Carloss, A.T. Kearney, and L. Patrick, Kay-Fries, Re: Historic Waste Management Practices, September 4, 1990.
- 168. Telephone Conference Between J. Carloss, A.T. Kearney, and L. Patrick, Kay-Fries, Re: Clarification of Historic and Current Waste Management Practices, October 2, 1990.
- 169. Telephone Conference Between J. Carloss, A.T. Kearney, and L. Patrick, Kay-Fries, Re: Clarification of Waste Types and Sources, October 5, 1990.
- 170. Telephone Conference Between J. Carloss, A.T. Kearney, and T. Gibson, Chemist, Stanford Research Institute, Re: Degradation Products of Diethylbenzene, October 13, 1990.

APPENDIX A PHOTOGRAPHIC LOG



Photograph 1-1. Looking southwest at Equalization Basin (SWMU No. 5) showing liner and inflow pipe from Lift Sump (SWMU No. 4). Influent pipe to Aeration Basin (SWMU No. 7) in foreground.



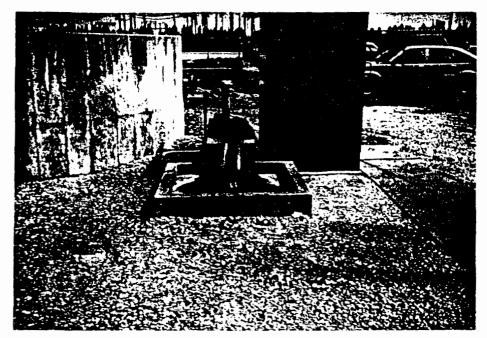
Photograph 1-2. Looking south at Lift Sump (SWMU No. 4) in foreground, and Wastewater Mix Basin (SWMU No. 6) with influent pipe to Aeration Basin (SWMU No. 7) at right. Note staining on Mix Basin.



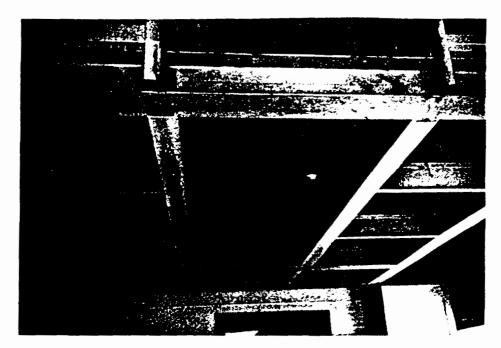
Photograph 1-3. Looking north at Aeration Basin (SWMU No. 7) with Influent Pipe from Mix Basin (SWMU No. 6) in foreground.



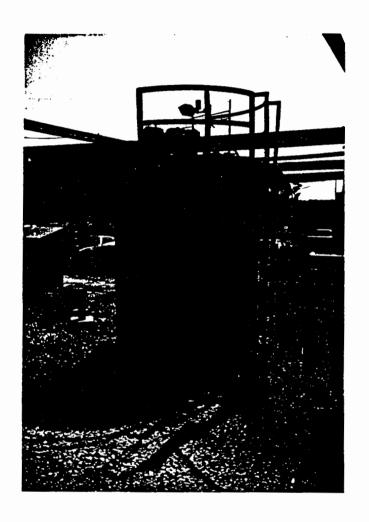
Photograph 1-4. Looking northeast at Clarifier (SWMU No. 8).



Photograph 1-5. Looking north at discharge point to Mobile POTW from Clarifier (SWMU No. 8).



Photograph 1-6. Looking north at Former Sludge Filter Press (SWMU No. 10) above floor in Filter Building.



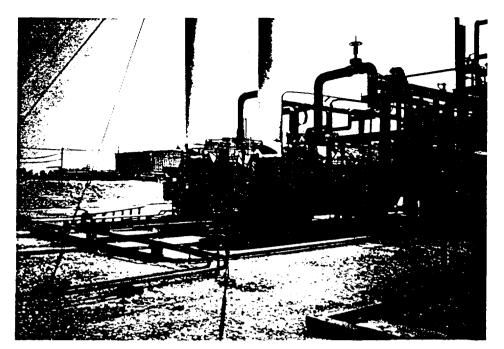
Photograph 1-7. Looking east at Former Sludge Settling Tank (SWMU No. 9).



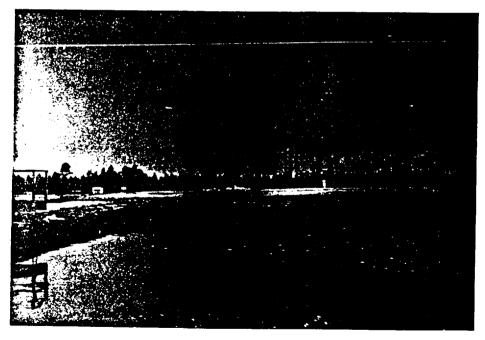
Photograph 1-8. Looking west at Run-off Ditch (AOC A) adjacent to steam boilers south of Equalization Basin (SWMU No. 5).



Photograph 1-9a. Looking south at Steam Boilers.



Photograph 1-9b. Looking northeast at Steam Boilers. Former Sludge Filter Press (SWMU No. 10) is housed in building in background (photograph provided by EPA).



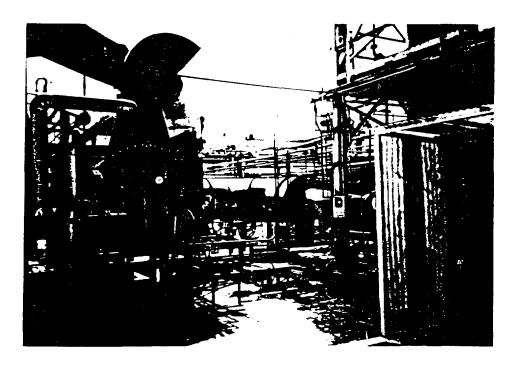
Photograph 1-10. Looking north at general view of Equalization Basin (SWMU No. 5) and Aeration Basin (SWMU No. 7), showing aeration unit in operation.



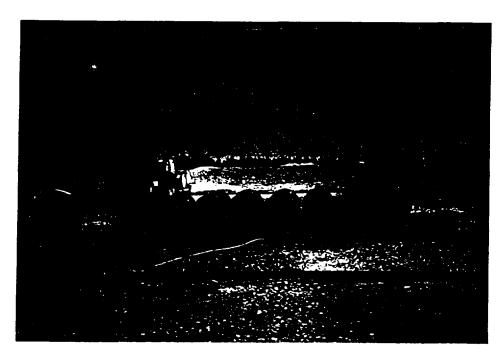
Photograph 1-11a. Looking east at Former Waste Heat Boiler (SWMU No. 20) on left and Former Incinerator (SWMU No. 19) on right (photograph provided by EPA).



Photograph 1-11b. Looking east at duct connecting Former Waste Heat Boiler (SWMU No. 20) on left and Former Incinerator (SWMU No. 19) on right (photograph provided by EPA).

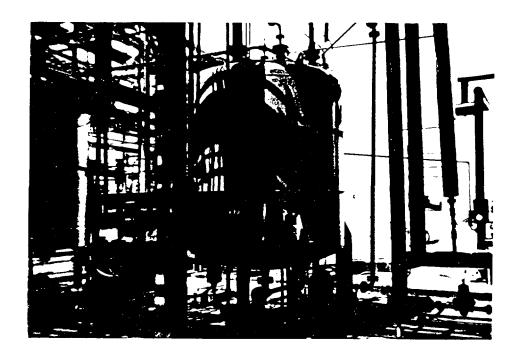


Photograph 1-11c. Looking southeast at duct connecting Former Caustic Scrubber (SWMU No. 20) and Former Incinerator (SWMU No. 19) on left (photograph provided by EPA).

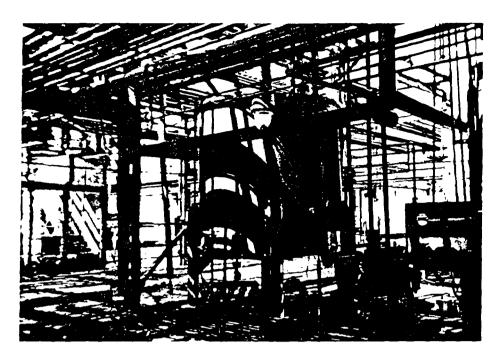


Photograph 1-11d. Looking north at Fuel Drum Storage Area adjacent to steam boilers. Equalization Basin (SWMU No. 5) in background. Note staining on pad under drum storage racks.

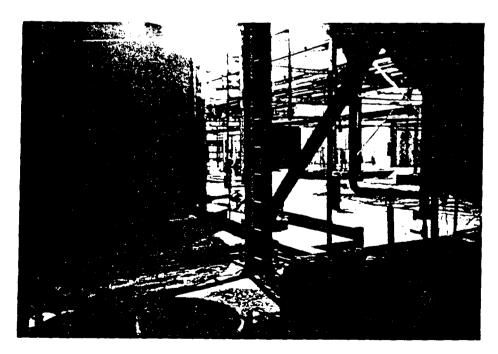
Photograph 1-12. VOID. Photograph of Manufacturing Area Floor Trenches (SWMU No. 1) underexposed.



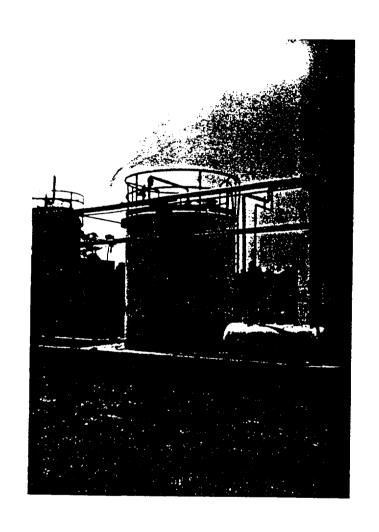
Photograph 1-13a. Looking southwest at Stripper Holding Tank - Tank No. 310 (SWMU No. 11). Note steel legs on unit and surrounding curbing.



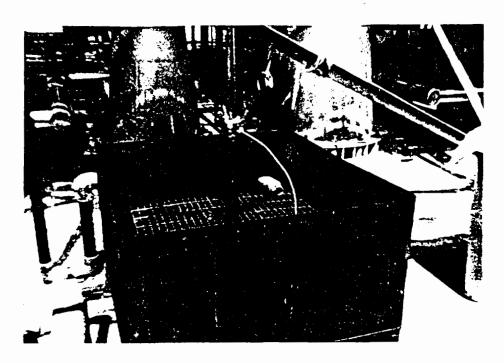
Photograph 1-13b. Looking southwest at Elementary Neutralization Tank - Tank No. 311 (SWMU No. 13) used to control wastewater pH and eliminate corrosivity characteristic. Note steel legs on unit and surrounding containment curbing.



Photograph 1-14. Looking east at Former Cyanide Stripper Column Site (SWMU No. 25) used to remove ammonia and cyanide from wastewater. Unit stood on concrete pad in right foreground.

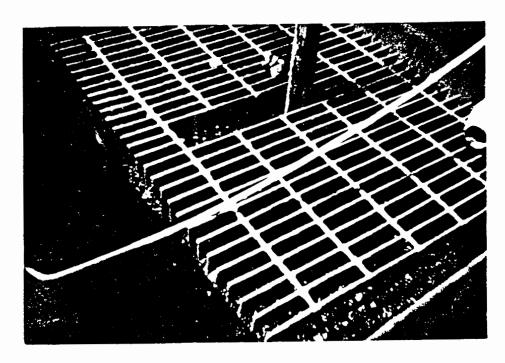


Photograph 1-15. Looking southeast at Hazardous Waste Tank - Tank No. S-446 (SWMU No. 15). Note surrounding containment ourbing.



Photograph 1-16. Looking west at Drum Rinse Unit (SWMU No. 22).

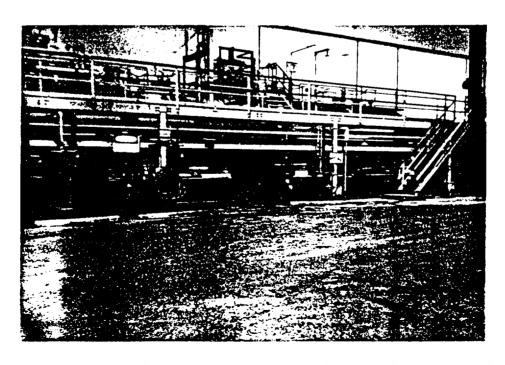
Note multiple-jet spray head on top of pipe in center of unit, and dark staining on interior walls above water level.



Photograph 1-17. Looking southwest at interior of Drum Rinse Unit (SWMU No. 22). Note heavy residue build-up beneath grating.



Photograph 1-18. Looking east at Empty Drum Storage Area adjacent to facility fence where drums cleaned in the Drum Rinse Unit (SWMU No. 22) are stored prior to off site reclamation at Mitchell Drum Co. No drums are present at unit (photograph provided by EPA).



Photograph 1-19. Looking northwest at Rail Loading/Unloading Area (SWMU No. 2).



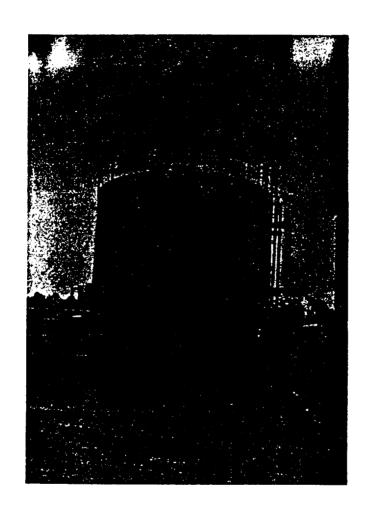
Photograph 1-20. Looking southwest at Silane Reboiler Bottoms Drum Storage Area. Note storage on pallets.



Photograph 1-21. Looking northwest at Container Storage Area (SWMU No. 16) in Product Storage Building.
Note drum labels and containers on pallets, as well as one rusted drum.



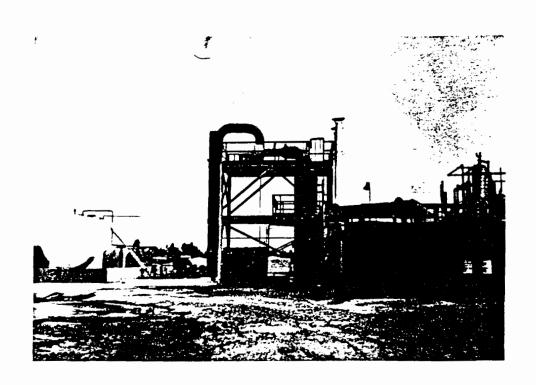
Photograph 1-22. Looking west-southwest at Former Sludge Disposal Site (SWMU No. 23) which was located at portable toilet site. Unit will be under new IPDA plant.



Photograph 1-23. Looking east at Cyad Wastewater Tank - Tank No. S-442 (SWMU No. 14).



Photograph 1-24. Looking southeast at Venturi Scrubber (SWMU No. 18) on top of Alcohol Scrubber. Unit is small rectangular unit on top of cylindrical tank.



Photograph 1-25. Looking north at Caustic Scrubber (SWMU No. 21) for Former Hazardous Waste Incinerator System.

APPENDIX B
VSI LOGBOOK

duct for gas in incinerator

aunits

- sent offsite to systech

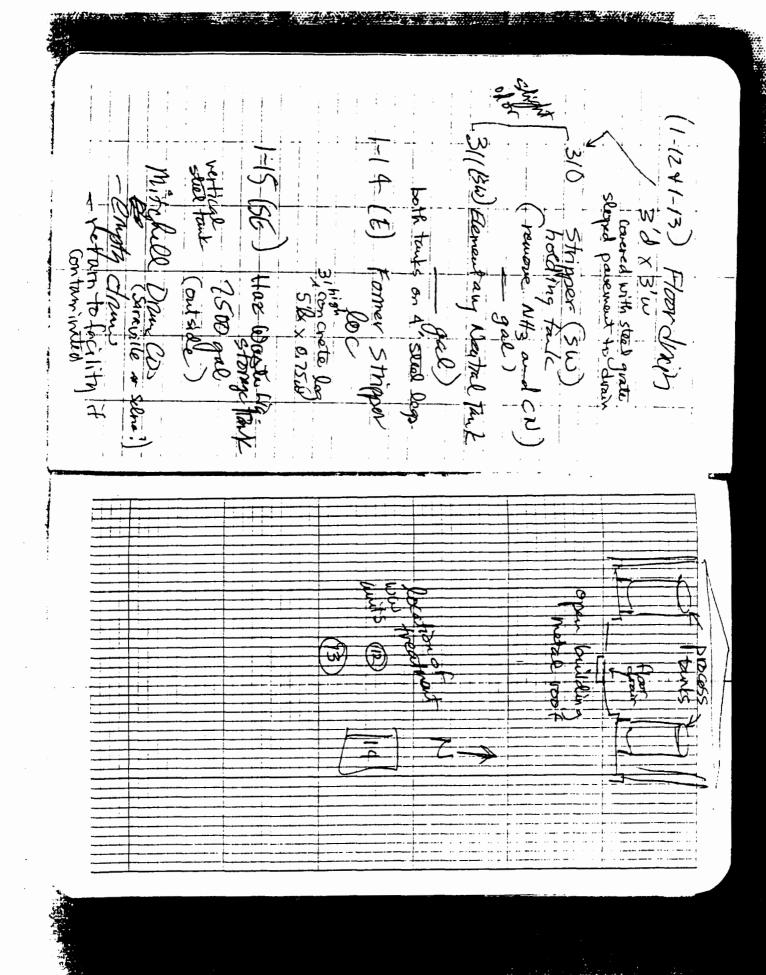
Junits

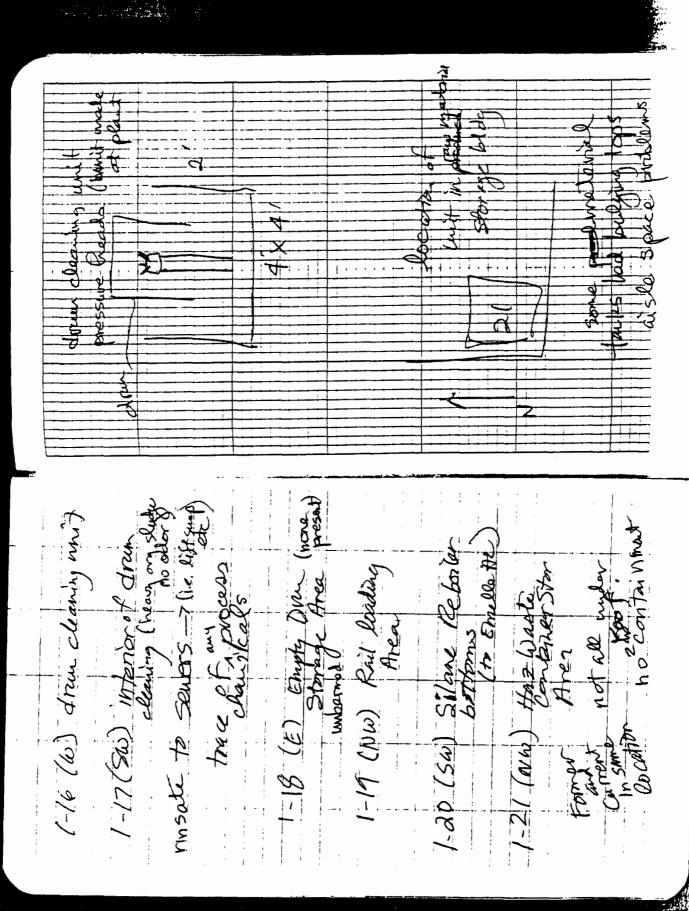
•

....

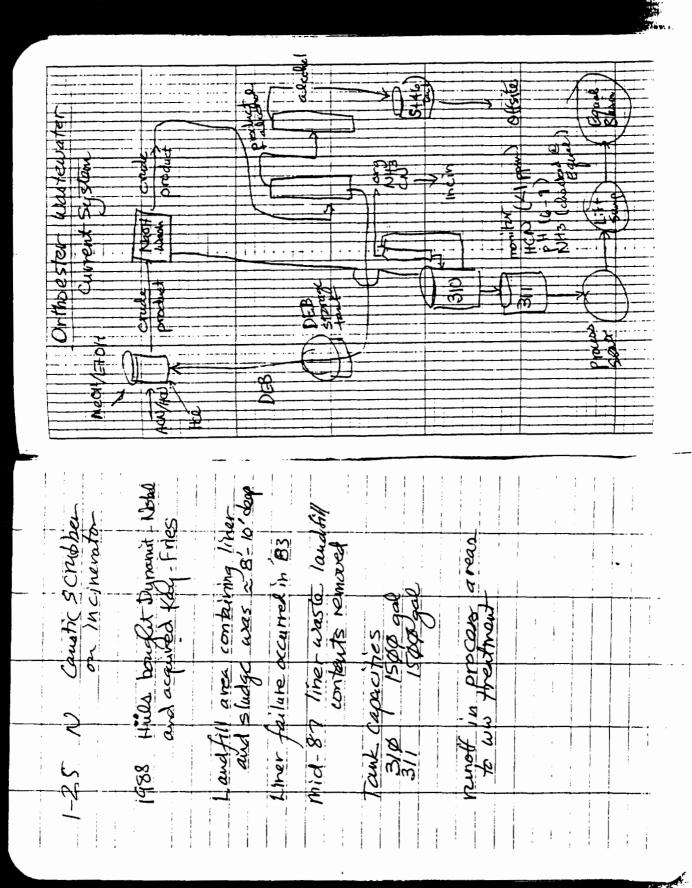
1-4 (NE) Clanified 20 des
201 20 des charge from
Clanifier to promo Clanifier to pollul grating to promo Clanifier to pollul grating to promo September of the promo September of September

Sac mad Mine in		cerning Susin	inellities months, traud	press used in early sos





Trucky to Mc Durky Is (postu. Gaste Want of BL N1, Sof mond produc site of new 100A plant



APPENDIX C

SWMU LOCATION MAP KAY-FRIES COMPANY THEODORE, ALABAMA

APPENDIX D

CHEMICAL ANALYSES FROM WASTEWATER TREATMENT UNITS

APPENDIX D-1

Summary of Analysis Results for Soil, Sludge, Basin Liquids, and Liquids Between Impoundment Liners and Basin Underdrain System, Equalization and Aeration Basins

Table 2 (continued): Summary of Analysis Results for Soil, Sludge Basin Liquids and Liquids Between the Impoundments Liners.

Parameter	Equalization Basin Sludge 5	Aeration Basin <u>Sludge ⁶</u>	Soils Beneath Equalization Basin 7	Soil Beneath Aeration Basin 7
pH (Unit)	6.6 - 6.8	7.8	4.6 - 4.9	4.7 - 5.2
Total Cyanide	9.4 - 35	12.2	<0.2	<0.2
Methanol (ppm)	<40 - 60	<40	NA	NA
Diethylbenzene (ppm)	3900 - 7000	340	<0.4	<0.4
Acetonitrile (ppm)	< 12.5	<0.1	<0.1	<0.1
Methylene Chloride (p	pm) NA	NA	NA	NA
Chloromethane (ppm)	<0.0625	<0.005	<0.005	<0.005
Chloroform (ppm)	<0.0625	<0.005	<0.005	< 0.005
Chloroethane (ppm)	<0.0625 - 5.6	0.054	<0.005	<0.005
1,1-Dichloroethane (p	pm) <0.6	0.320	< 0.005	< 0.005
1,1,1-Trichloroethane		0.9	<0.005	<0.005
Benzene (ppm)	<0.61 - 1.1	<0.005	<0.005	< 0.005
Toluene (ppm)	10 -24	<0.005	<0.005	< 0.005
Ethylbenzene (ppm)	<0.6 - 4.1	0.007	<0.005	< 0.005
Xylene (ppm)	<0.6 - 1.5	0.016	<0.005	0.015
2-Butanone (ppm)	8.9 -10	<0.01	<0.010	<0.010

⁵⁻ Range of results or maximum from two samples collected 1/26/87, wet weight basis

⁶⁻ Results of a single sample collected 1/27/87, wet weight basis

⁷⁻ Range of results or maximum from two samples collected 1/28/87

NA- Not Analyzed

ChesterLaboratories

A Division Of

The Chester Engrees

B45 Faura Arence Prone: (412) 262 1025

Laboratory Analysis Report For

224 000 608

Kay Fries Alabama, Inc.

Samples Received:

12/11/81

452

Report Date:

3/8/82

A L - X X G T S O - 4 5 2 - 0 0 2

Source	Sludge Sample Clarifier Overflow
Log No. 81- Date Collected	7532 12/10/81
pH Flash Point, *F Reactivity Corrosivity	8.8 >200 Non-Reactive Non-Corrosive
Methanol, mg/L Total Cyanide, mg/L CN Amenable Cyanide, mg/L CN Acetonitrile, mg/L Diethyl Benzene, mg/L Ethanol, mg/L Dimethyl Ether, mg/L Methyl Formate, mg/L	1.099 1.78 0.074 2.6 70.3 <1.0 <1.0
Ethyl Formate, mg/L Ethyl Chloride, mg/L Methyl Acetate, mg/L Methylene Chloride, mg/L Triethyl Orthoformate, mg/L Trimethyl Orthoformate, mg/L Trimethyl Orthoacetate, mg/L Chloride, mg/L Cl	<1.0 <1.0 <1.0 0.012 <1.0 <1.0 <1.0 2,050
pH Arsenic, mg/L As Barium, mg/L Ba Cadmium, mg/L Cd Chromium, mg/L Cr Lead, mg/L Pb Mercury, mg/L Hg Selenium, mg/L Se Silver, mg/L Ag	7.0 <0.001 0.2 0.01 0.02 <0.02 <0.001 <0.001 <0.001

[.] Unless otherwise noted, analyses are in accordance with methods and procedures outlined and approved by the Environmental Protection Agency and conform to quality assurance protocol.

"Less-than" (<) values are indicative of the detection limit.

APPENDIX E

Summary of Ground Water Contamination Indicator Parameters Kay-Fries Theodore, Alabama

Monitoring Well No. 1

Sample Date	<u>Reference</u>	pH[°C]	Specific Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
7/22/83	20	6.1-6.2 [29]	84-90	<1-3.5	<10
10/13/83	20	5.8[21]	62-72	<1-1.2	<10
1/18/84	20	5.2-5.3	46-49	<1-1.3	<10
•		[16]			
4/26/84	20	4.7-4.8	42-45	<1	<10
		[21]			
10/12/84	26	5.3-5.4	30-43	<1	<10
		[26]			
3/1 4 /85*	42	4.6[20]	56	7.1	NA
4/12/85	5 5	5.3[-]	40	<1	<10
10/22/85	55	5.3-5.4	25-26	<1-1.6	9-16**
		[-]			
4/18/86	81	4.9-5.0	42-44	<1	<5
		[10-12]			
6/30/87	84	NA	NA	NA	NA
11/9/87*	87	4.9-5.0	48-67	5.7	NA-
4/19/88	96	5.1[19]	47-48	<1-1.2	<5-34

NA = not analyzed
* ADEM sampling
** Detection limit changed from 10 ug/l to 5 ug/l after this date

Monitoring Well No. 2

Sample Date	Reference	pH[°C]	Specific Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
7/22/83	20	NA	NA	NA	NA
10/13/83	20	NA	NA	NA	NA
1/18/84	20	NA	NA	NA	NA
4/26/84	20	NA	NA	NA	NA
10/12/84	26	5.4-5.5	40-45	<1	<10
		[28]			
3/14/85*	42	4.5[21]	36	6.1	NA
4/12/85	5 5	NA	NA	NA	NA
10/22/85	55	NA		NA	NA**
4/18/86	81	4.7-4.9	43-44	<1	5-9
		[10-13]			
6/30/87	84	NA	NA	NA	NA
11/9/87*	87	5.1[21]	47-58	23.8	NA
4/19/88	96	5.0[20]	47-48	<1-1.3	<5 - 5.6

NA = not analyzed
* ADEM sampling
** Detection limit changed from 10 ug/l to 5 ug/l after this date

Monitoring Well No. 3

Sample Date	Reference	pH[°C]	Specific Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
7/22/83	25	6.3[32]	86	1.8	<10
10/13/83	25	5.5[21]	44	1.4	<10
1/18/84	25	4.9[16]	36	<1	<10
4/26/84	25	4.7[22]	39	<1	<10
10/12/84	26	5.0-5.2	32-33	<1	<10
. ,		[25]			
3/14/85*	42	4.5[21]	36	6.1	NA
4/12/85	55	5.4-5.8	34	<1	<10-43
• •		[-]			
10/22/85	55	5.0[-]	32 - 33	<1	<5**
4/18/86	81	5.1-5.3	40-45	<1-1.4	<5-8
		[10-12]			
6/30/87	84	5.3-5.9	37-39	<1-2	<2***
		[25-26]			
11/9/87*	87	5.2-5.3	42-206	2.4	NA
		[29-35]			
4/19/88	9 6	5.1-5.2	40	<1	<5-35
		[20]			

NA =not analyzed

* ADEM sampling

** Detection limit changed from 10 ug/l to 5 ug/l

*** Detection limit changed from 5 ug/l to 2 ug/l

Monitoring Well No. 4

Sample Date	Reference	pH[oC]	Specific Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
7/22/83	20	6.6[30]	125	3.4	12
10/13/83	20	5.8[22]	62	2.2	16
1/18/84	20	5.2[17]	55	1.4	<10
4/26/84	20	5.4[25]	56	<1	<10
10/12/84	26	5.8-6.1	48-55	<1	<10
,		[28]			
3/14/85*	42	4.5[22]	43	7.1	NA
4/12/85	5 5	5.5-5.7	40-42	<1	<10-31
		[-]			
10/22/85	55	5.3-5.4	37-40	<1-2.4	<5-11**
		[-]			
4/12/86	81	5.3-5.5	39-43	1.8-2.0	9-12
		[-]			
6/30/87	84	5.1-5.8	37-39	<1-3.2	<2***
		[26-27]			
11/9/87*	87	5.4-5.5	39-79	2.5	NA
		[22-23]			
4/19/88	96	5.1-5.2	40-41	<1-2.0	<5-6.1
		[21]			

NA =not analyzed

* ADEM sampling

** Detection limit changed from 10 ug/l to 5 ug/l

*** Detection limit changed from 5 ug/l to 2 ug/l

Monitoring Well No. 5

Sample Date	<u>Reference</u>	pH[oC]	Specific Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
7/22/83	20	6.1[29]	96	3.6	<10
10/13/83	20	6.0[20]	61	2.2	<10
1/18/84	20	4.9[16]	49	<1	11
4/26/84	20	4.6[25]	56	<1	<10
10/12/84	26	5.6-5.7	43-46	<1	<10
		[28]			
3/14/85*	42	4.5[20]	60	6.9	NA
4/12/85	5 5	5.4[-]	43	<1	<10
10/22/85	55	5.2-5.7	42-47	<1	<5**
		[-]			
4/18/86	81	4.9-5.1	42-43	<1	<5 - 6
		[12-14]			
6/30/87	84	5.4-5.7	46-49	<1-1.8	<2***
		[-]			
11/9/87*	87	5.0[21]	44-61	3.9	NA
4/19/88	96	5.1[19]	44-46	<1-2.0	10-21

NA = not analyzed
* ADEM sampling
** Detection limit changed from 10ug/l to 5 ug/l
*** Detection limit changed from 5 ug/l to 2 ug/l

Monitoring Well No. 6

Sample Date	<u>Reference</u>	pH[oC]	Specific Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
7/22/83	20		~-		
10/13/83	20				
1/18/84	20				
4/26/84	20				
10/12/84	26				
3/14/85*	42				
4/12/85	55				
10/22/85	5 5				
4/18/86	81				
6/30/87	84	6.3-6.4	290-520	1.4-3.8	43-100
		[24]			
11/9/87*	87	6.6	970-1070	7.4	NA
4/19/88	96	5.1	40-42	1-1.1	7-12

NA = not analyzed
-- = well not installed
* ADEM sampling

Monitoring Well No. 7

Sample Date	<u>Reference</u>	pH[oC]	Specific Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
7/22/83	20				
10/13/83	20				
1/18/84	20				
4/26/84	20				
10/12/84	26				
3/14/85*	42	~-			
4/12/85	55				
10/22/85	55				
4/18/86	81				
6/30/87	84	4.9-5.0 [25-26]	150-170	<1-2.9	16 - 28
11/9/87*	87	4.8-5.0 [21]	208-212	4.7	NA
4/19/88	96	5.1[19]	230-240	<1-1.0	6.3-21

NA = not analyzed
-- = well not installed
* ADEM sampling

APPENDIX F

Characteristics of Soil Types Kay-Fries Theodore, Alabama

Characteristics of Soil Types Kay-Fries, Theodore, Alabama

Soil Name (Map Number)

General Characteristics

Benndale sandy loam (9,10)

well drained; moderately permeable
(0.6-2.0 in/hr); low in natural
fertility and organic content;
strongly acidic (pH = 4.5-5.5)

Typical Column

<u>Zone</u>	Soil Color/Type	Thickness (in)	Depth (in)	
Surface	dark gray sandy loam	5	5	
Subsurface .	light yellow-brown sandy loam	6	11	
Upper subsoil	yellow-brown loam	29	40	
Lower subsoil	yellow-brown clay loam	32	72	

Soil Name (Map Number)

General Characteristics

Escambia sandy loam (16)

poorly drained; moderately permeable (0-8" depth, 2-6 in/hr; 8"-32" depth, 0.6-2.0 in/hr; 32"-65" depth, 0.06-0.6 in/hr); low in natural fertility and organic content; strongly acidic (pH = 4.5-5.5); seasonal water table in winter and spring at 1.5'-2.5' depth

<u>Zone</u>	Soil color/type	Thickness (in)	Depth <u>(in)</u>
Surface Subsurface	very dark gray sandy loam light olive-brown loam	5 3	5 8
Upper subsoil	light gray-brown loam	24	32
Lower subsoil	mottled gray, brown, red, and yellow loam with 5%-10% plinthite nodules*	33	65

^{*} Plinthite is the sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents which irreversibly forms ironstone hardpan or irregular aggregates when exposed to repeated wetting and drying. It is one form of laterite.

Soil Name (Map Number)

General Characteristics

Grady loam (19)

poorly drained; slow permeability (0-6" depth, 0.6-2.0 in/hr; 6"-12" depth, 0.2-0.6 in/hr; 12"-66" depth 0.06-0.2 in/hr); low in natural fertility and organic content; subject to wetness and ponding

Typical Column

<u>Zone</u>	Soil color/type	Thickness (in)	Depth (in)
Surface	black loam	6	6
Upper subsoil (top)	dark gray loam	6	12
Upper subsoil (mid)	dark gray clay	11	23
Upper subsoil (base)	gray clay	12	35
Lower subsoil	<pre>mottled light gray,gray, and reddish-yellow clay</pre>	31	6 6

Soil Name (Map Number)

General Characteristics

Heidel sandy loam (23)

welldrained; moderately permeable (0.6-2.0 in/hr); low in natural fertility and organic content; good septic drainage

<u>Zone</u>	Soil color/type	Thickness (in)	Depth (in)
Surface	dark gray-brown sandy loam	7	7
Upper subsoil	red-brown to yellow-red sandy loam	26	33
Lower subsoil (top)	red sandy clay loam	35	68
Lower subsoil (base)	red sandy loam	24	92

Soil Name (Map Number)
Malbis sandy loam (30,31)

General Characteristics
moderate to high water retention;
moderately well drained; moderate
permeability (0-46" depth, 0.6-2.0
in/hr; 46"-72" depth, 0.2-0.6in/hr)
low in natural fertility and organic content; moderately to strongly
acidic (0-7" depth, pH=5.1-6.0;
7"-72" depth, pH=4.5-5.5); severe
limits on septic drainage; seasonal
water table at 2.5'-4' in winter

Typical Column

Zone	Soil color/type	Thickness (in)	Depth (in)
Surface	dark gray-brown sandy loam	5	5
Subsurface	yellow-brown and dark gray-brown sandy loam	2	7
Upper subsoil	yellow brown loam	39	46
Middle subsoil	yellow-brown loam with 10%-20% slightly brittle plinthite nodules	14	60
Lower subsoil	mottled brown, yellow, red, and light gray sandy clay loam with 10%-20% slightly brittle plinthite nodules	12	72

Soil Name (Map Number)

General Characteristics

Notcher sandy loam (33)

moderate water retention; moderately well drained; moderately permeable (0-44" depth, 0.6-2.0 in/hr; 44"-76" depth, 0.2-0.6 in/hr); low innatural fertility and organic content; strongly acidic (pH=4.5-5.5); severe limits septic drainage; seasonal water table at 3'-4' depth in winter

<u>Zone</u>	Soil color/type	Thickness (in)	Depth (in)
Surface	dark gray-brown sandy loam	7	7
Upper subsoil	yellow-brown loam with 10%-25% iron concretions	37	44
Lower subsoil	mottled gray, yellow, red, and brown loam with 10%-15% plinthite nodules	32	76

Soil Name (Map Number)

General Characteristics

Poarch sandy loam (39)

moderately well to well drained; moderately permeable (0-11" depth, 2-6 in/hr; 11"-36" depth, 0.6-2.0 in/hr; 36"-66" depth, 0.2-2.0 in/hr); moderate water retention; low in natural fertility and organic content; strongly acidic (pH=4.5-5.5); severe limits on septic drainage

Typical Column

Zone	Soil color/type	Thickness (in)	Depth (in)
Surface	very dark gray-brown sandy loam	6	6
Subsurface	light yellow-brown sandy loam	5	11
Upper subsoil	yellow-brown loam	25	36
Middle subsoil	brown-yellow loam mottled in brown, red, and yellow with 5%-10% plinthite	12	48
Lower subsoil	mottled gray, yellow, brown, and red sandy clay loam with 5%-10% plinthite	18	6 6

Soil Name (Map Number)

General Characteristics

Smithton sandy loam (45)

poorly drained; moderately slow permeability (0-17" depth, 0.6-2.0 in/hr, 17"-72" depth, 0.2-0.6 in/hr); moderate to high water retention; low in natural fertility and organic content; strongly acidic (pH=4.5-5.5); water table near surface in winter and spring; poor potential for urban use

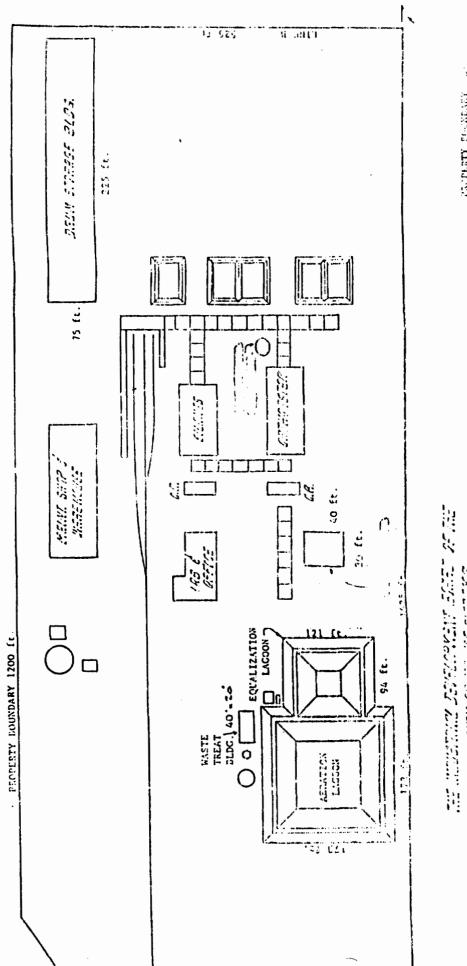
Zone	Soil color/type	Thickness (in)	Depth (in)
Surface	dark gray-brown sandy loam	7	7
Subsurface	gray sandy loam with yellow and brown mottling	10	17
Upper subsoil	light gray sandy loam	9	26
Middle subsoil	light gray loam	21	47
Lower subsoil	light gray silt and loam	25	72

- APPENDIXC

Page			
Company	 <u> ئارائىي</u>	Chimical	1 Inc

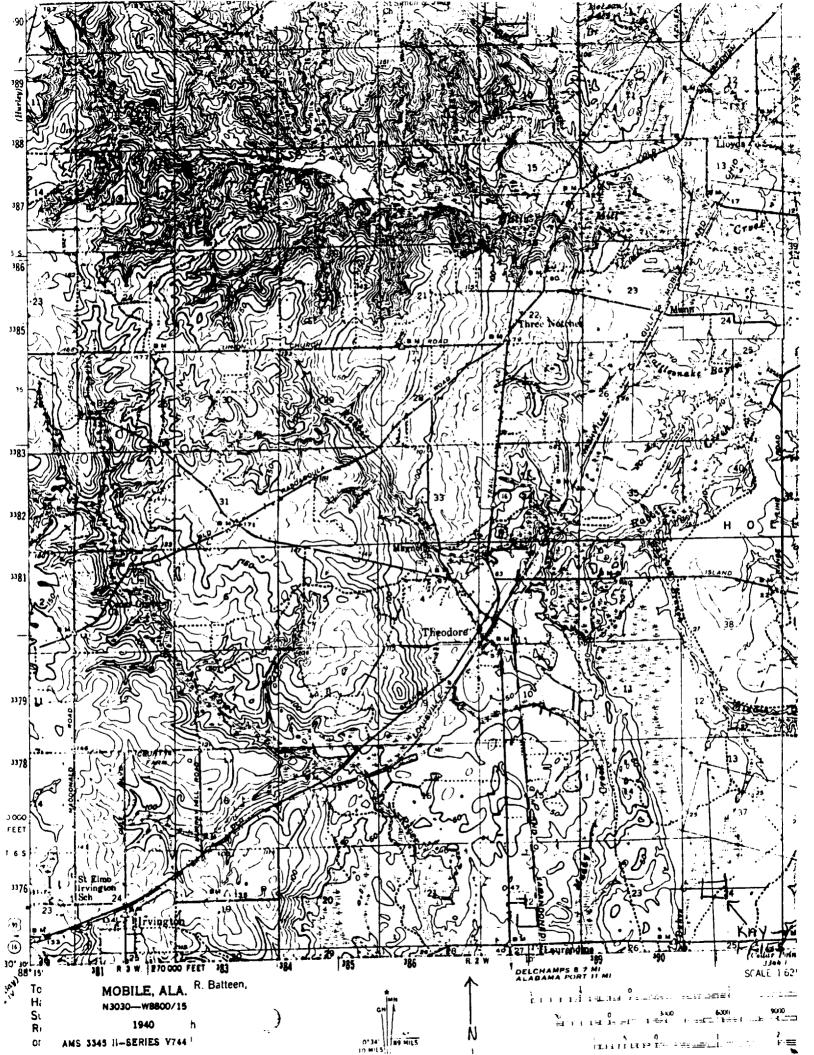
Facility I.D. No. ALD Doc 60877

		Description	
,	3 3	Summary	10
		EPS_form, 3012-TTT	
		EPS form 3012-TTI	7 .3
		EPS Sorm 3017-1	i.
		EPS. Som 3012-V Com	
		EPS Jorn 3012-I	
		PA Post 1	15
		PAPart 1 PAPart 2	2.0
	·	FAPart 3 blank	€.
		1. Part 3 Flank	
		Land Program	
		Land Program Cost	
		Land Program "	
		Ottochment 1 -! -	
		12 deliment /	
	3.24	 Letter Dan Chin	
		Letter D. Commen	
		Alle D. Commerce	• • • • • • • • • • • • • • • • • • • •
		 The Gudayiox 10 min sont	
		 Tomo! from min sont	<u> </u>
		Mic Smith	
		 Waste Cenerator Perrit	
		itoz. Waste generator regions	10,5
		C. C. C.	
		te u u	- :
		ek CK	



PATTENTY POSTERNY OF THE THE STREET OF THE STREET S

Bearing Total



LAND PROGRAM

83 Hazardous Waste Generator and On-Site TSD Facility Annual Report

n 🚈.			14 18781 000	is agrie General	J 610 04-3114 1	iso recitity willost Repor	•	
MUTE	Reed all	Instructions prior	to completing thi	s form.				
	. (astalia	tion EPA ID Number:	MUDIOIOIO	018/2/2/4				
41	· Name of	installation:	Kay-Fries,	Inc.				
111	. location	of installation:	Rangeline	Road Extensio	on. Theodore	Industrial Park		
, , ,		•			(Street or Route	n Kumber)		
		odore r Towa)		Mobi (Cou		Alab (State		36582 (Zip Code)
	Sales of	1 10-47			, ,			(21) (000)
		tion Contact:	David B. R	amey		205	653-5400	
•*	to the second	(Nom	•)			(Area Code)	(Telephone Numb	er)
	. Maste Id	antification:			4			
H	A. EPA	B. Descriptio	n of	C. Quantity		Waste by Handling Metho		
Number	Kaste Humber	Waste	1	Generated (LBS)	1. Handling Method	2. Quantity Stored, Treated	1	ff-Site Treatment Recovery Facility
Line Nu				(10-2)	Code	Disposed, or Recovered Cn-Site	3. Quantity	4. Facility EPA ID No./Recovery Facility Name
	D001	Filter Aid Slu	dac	118,700	D30	1:8.700	118.700	ALDG00622464
•	Non-				1/30	1 (.700	13.700	M.E.O. 1952.2464
2.	Hazardous	Ammonium Chlor	ide	37,560	030	37,560	37.560	ALD000622464
3.	Non- Hazardous	Ammonium Chlor	ide	305,532	D80	305,532	305.532	AI DO00622464
4.	W.A.	and Aeration	Basin Sludge		·			
5.	Non- Hazardous	IBTMO Salt		53,100	D80	53,100	53.100	ALD000622464
			(if so	re space is need	ed, check e	nd complete Attachment I)	
Y	l. Closure	Cost Estimate for F	acilities \$ 70	,000				24 25 2 6 3
¥I	I. Cout Est	limate for Post-Clos	ure Monitoring a	nd Kaintenance (Disposel Facili	ty Only) \$7/a		
VII	i. Certifit	setions // /			ı			
		land by		D. B. F	li ney		Plant Marage	r
		(\$!gnature)	-	(Pr	Int or Type Nem	•}	(Tit	

. A corfify under penalty of law that I have personally expained and am familiar with the information submitted in this and all attached documents and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the sub-

Wests identification: A. EPA B. Description of C. Quantity D. Amount of Waste by Handling Method Maste Generated 1. Handling 2. Quantity Shipped to Off-Site Treatment, **Waste** Numb Number Method Stored, Treated Disposal, or Recovery Facility (LBS) Disposed, or 3. Quantity 4. Facility EPA ID Code Line Recovered On-Site No./Recovery Fecility Name Non-MTMS Salt Hazardous 71,200 D80 71,200 71,200 ALD000622464 Combustible 2 Liquid Silanes Reboiler Bottoms 40,200 D80 40,200 40,200 ALD000622454 Non-Hazardous CPTMO Salt 9,900 D80 9,900 9,900 ALD000622464 Holding Pond Sand and D002 Grave1 235,500 D80 285,500 285,500 ALD000622464 Caustic Wash D002 Stripper Bottoms 2,625,294 T02 2,625,294 0 6J D003 Knock-out Pot Waste 30,000 T02 30,000 0 10. 13 200 . . . 17 18

to the same and the state of th

LAND PROGRAM

19.32 Hazardous Waste Generator and On-Site TSD Facility Annual Report

NOTE:	Read all Instructions prior t	completing this form.
ι.	Installation EPA ID Number:	ALD 00060821241
11.	Name of Installation:	Kay-Fries, Alabama, Inc.

Rangeline Road Extension, Theodore Industrial Park Location of Installation:

	(Street or Route Numb	er)	_
Theodore	Mobile	Alabama	36582
(City or Town)	(County)	(State)	(ZIp Code)

Robert H. Lance 205 653-5400 Installation Contact: (Area Code) (Name) (Telephone Number)

Waste Identification:

Name of Installation:

ы	A. EPA	B. Description of	C. Quantity	D. Amount of	Waste by Handling Method	<u> </u>			
Number	Waste Number	Waste	Generated (LB3)	1. Handling Method	2. Quantity Stored, Treated		Shipped to Off-Site Treatment Disposal, or Recovery Facility		
Line Nu				Code	Disposed, or Recovered On-Site	3. Quantity	4. Facility EPA ID No./Recovery Facility Name		
1.	D001	Filter Aid Sludge	161,150	D80	161,150	161,150	ALD000622464		
	Non-	Ammonium Chloride	867,757	D80	867,757	867,757	ALD000622464		
3.	Non- Hazardous	Ammonium Chloride and	365,310	D80	365,310	365,310	ALD000622464		
4.		Aeration Basin Sludge							
5.	Non-	IBTMO Salt	64,500	D80	64,500	64,500	ALD000622464		

(if more space is needed, check $[\underline{y}]$ and complete Attachment i)

VI.	Closure (Cost	Estimate	for	Facilities	5_	70,000
-----	-----------	------	----------	-----	------------	----	--------

Cost Estimate for Post-Closure Monitoring and Maintenance (Disposal Facility Only) \$ π/a VII.

V111. Certification:

R. H. Lance

Plant Manager

(Signature)

(Print or Type Name)

(Title)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the sub-

٧.				 			
Number	A. EPA Waste Number	B. Description of Waste	C. Quantity Generated (LBS)	D. Amount of 1. Handling Method	Waste by Handling Method 2. Quantity Stored, Treated		ff-Site Treatment, Recovery Facility
Line N				Code	Disposed, or Recovered On-Site	3. Quantity	4. Facility EPA ID No./Recovery Facility Name
1.	Non- Hazardous	MTMS Salt Caustic Wash	59,700	D80	59,700	59,700	ALD000622464
2.	D002	Stripper Bottoms	2,485,010	T02	2,485,010	0	n/a
١ _	D003	Knock-out Pot Waste	30,000	T02	30,000	0	n/a
4	D001	Silanes Distillate Residu	e 25 ,23 0	т02	25,230	0	n/a
5.							
6							
7							
8							
9							
10	į						
13							
14	İ				·		
15	1						
16	}						
17							
119	ì						

- ----

2. PROJECT MANAGEM	MENT : E 7
--------------------	------------

.

and the second residue to the second residue

Site Name: KAY- FRIES CHEMICALS, INC.
Site Number: ALD 000 608224
Owner: KAY-FRIES CHEMICALS, INC.
Operator: KAY- FRIES CHEMICALS, INC.
Site Status: Active Inactive Unknown
Priority: High Medium Low None
,
3. FINAL DISPOSITION
I. EPS Final Review - Date: 8/13/84 Comments:
Site Inspection Required // Yes // No
II. ADE1 Review - Date: Comments:
Follow-up Action Required /_/ Yes /_/ No
III. Final Disposition: Review & revise Date: Elited & correct Date: Transmitted Date: File close-out Date: Initiate site inspection Date:
4. ADDITIONAL COMMENTS (ONGOING & FINAL)
TO THE BEST OF OUR KNOWLEDGE THIS 15
TO THE BEST OF OUR KNOWLEDGE THIS IS A RORA FACILITY ONLY.
A ROLL PROJECT

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT EPS FORM 3012-III

INDUSTRIAL NARRATIVE SHEET

1. Site Identification:

Site number: ALB000608224

Site name: Kay-Fries Chemicals, Inc.

Site county: Mobile

Industrial Narrative Summary:

Company Name: Kay-Fries Chemicals

Address: P.O. Box 889

Theodore, Al. 36590

Telephone No.: 205-653-5400

Contact: Gary Criscione

Discussion: This plant was constructed in 1980 and is involved in manufacture of organic chemicals. Since the time that construction was proposed, they have worked with the ADEM office to assure compliance with environmental requirements. Conversations with ADEM staff indicate that this company has chosen to abide by much more stringent requirements than required to avoid any future problems. They are eligible for regulatory exemptions, however they have chosen not to take advantage of them. They are currently preparing the Part B application for submission in November of 1984. When the site was under construction, they found no evidence of any past disposal activities. Although the property was previously owned by the Army and was used as an ammunition depot, they found no evidence of any bunkers, silos or buried material at the site. They indicated that silos are still present on adjacent property.

- 3. Disposition: No further action under this program. This facility has been regulated since its construction by the ADEM office. They are presently in the process of obtaining a TSD permit.
- 4. Comments: If not already done, the Kerr-McGee property should be investigated for remaining ammunition and disposition of material disposed there by the Army.

PRELIMINARY ASSESSMENT EPS FORM 3012-II

TELEPHONE LOG SHEET

1.	Site Identification:
	Site number: ALD000608224
	Site name: Kay-Fries Chemicals, Inc.
2.	Interview Data: (Party called)
	Name: Gary Criscione
	Position: Production Supervisor
	Firm: Kay-Fries
	Address.O. Box 889
	Theodore, Al 36590
	Telephone No.: (205) 653-5400
_	
3.	EPS Analyst Data:
	Name: Donalea Dinsmore
	Purpose of call: <u>Directions to site, inquire about past disposition of site</u>
	Form 2070-12 (7-81) P.N.
	Date of call:8-10-84
1.	Interview Narrative Summary: Directions given to site. Site is on former
	Army property but didn't his have any evidence of any disposal. No
	ammo depots on siten. Nothing dug up durein construction. Depots mere
	on Kerr-McGee property and can still see silos. Plant was constructed
	in 1980 and operations began in April 1981.
	In 1900 and Operations began in April 1901.
	Disposition/Comments:
	No further action
5.	Comments: Any additional sites used by this company?
. •	Location:
	Dates of use:
	Description of waste:
	Comments:
	Management of the state of the

ENVIRONMENTAL PROTECTION SYSTEMS, INC. Alabama RCRA 3012 Site Ranking Scheme EPS Form 3012-V

Site Number ALDOOD 608224

Preliminary Assessment Ranking Scheme to Determine Which Sites Merit Further Action.

(Select one answer for each of the following seven questions)

1.	Are Hazardous Substances Present? A. Confirmed on site! B. Suspected at site! C. It is unknown! D. No hazardous substances E. RCRA facility only!	10 points 5 points 2 points 0 points 0 points
2.	Is There a Pollution Dispersal Pathway? A. Direct to surface and/or groundwater. B. Indirect to surface and/or groundwater. C. Suspected to surface and/or groundwater. D. Not known for sure. E. No pathway.	5 points 4 points 3 points 2 points 0 points
3.	Characteristics of Human Population? A. High density. B. Medium density. C. Low density. D. No population.	5 points 4 points 3 points 2 points
4.	Characteristics of Natural Environment? A. Critical habitat including endangered species, etc. B. Sensitive habitat. C. Common less sensitive habitat.	5 points 3 points 2 points
5.	How is Human Population Affected By Site? A. Public utility of drinking water from site. B. Direct public access to site. C. Public access to affected surface water. D. Only potential for human population contact. E. Low or no potential for contact.	5 points 4 points 3 points 2 points 1 point
6.	Facility Management Practices at Site? A. Site actively supervised and managed currently with monitoring reports and other permit and report requirements. B. Site inadequately managed records not up-to-date.	1 point 3 points

1	С.	Site not currently managed or regulated.	4 points	
ł	D.	Abandon site.	5 points	
7.		ential Responsible Parties for Site perations?		
		Controlling party identified and accepts responsibility for site.	1 point	
1	В.	Suspected controlling party identified but does not accept responsibility for site.	4 points	
(:	No responsible party available.	5 points	
Rank [.]	ing	Score =		
#]	0	x #2 + #4 + #3 x #5 +	-#6 + -	#7

TABLE 1. Ranking Assessment

NUMERICAL RANGE	PRIORITY ASSESSMENT
0-50	NONE
50-150	LOW
150-300	MEDIUM
300 - 450	HIGH

Ranking Score:

Priority Assessment: NONE

POTENTIAL HAZARDOUS WASTE FE PRELIMINARY ASSESSMEN EPS FORM 3012-I EPS ANALYST/REVIEWER CHECKLIST

Instructions:

To be used in conjunction with EPA Form 2070-12 (7-81). Attach on inside front site folder. Initial and date for all assessment entries under appropriate part/subpart as completed. initial/date in black for final assessment; in red higher level (additional) assessment is in order. Follow same procedure for review process.

Review Codes:

1-Toxicology Review; 2-Chemical Review; 3-Ecology Review; 4-Chemical Engineer

Review; 5-Geotechnical Review; 6-Project Manager Review; 7-Final Review

				ST/REVIEW				
Form 2070	Analyst/	Review	Review	Review	Review	Review	Review	Review
Part Number	Date	Code l	Code 2	Code 3	Code 4	Code 5	Code 6	Code 7
1.1٧1.	D 8/10/84						fun8/0	Jun 8/13
2.1.								
2.11.				<u> </u>		ļ		
2.111.			·	ļ. <u></u>		ļ	<u> </u>	
2.17.							ļ	
2.V.			· · · · · · · · · · · · · · · · · · ·					
2.VI.							<u> </u>	
				<u> </u>				
3.1.								
3.11.8								
3.II.B							<u> </u>	
3.11.C								
3.II.D								
3.II.E								
3.11.F								-
3.11.G	-							
3.11.н								
3.11.I								
3.II.J			<u></u>					
3.II.K			* 					
3.1T.L								
3.11.M								
N.11.8								
3.11.0								
3.11.P								
3.111.								
3.1V.								

^{*}No further assessment/review required, enter NA

SEPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT

I. IDENTIFICATION
OF STATE OF STITE NUMBER
AL DOOGO822 4

PART	-SITE INFORMA	TION AN	ID ASSESSMEN	T AL	D 00060879 4
II. SITE NAME AND LOCATION					
01 SITE NAME (Legal common or descriptive name of afte)	. —				(P.O. Box 889)
KAY-FRIES CHEMICA	LS, INC	HED		DUSTRIAL HAG	107COUNTY 108 CONG
THEODORE 103 COORDINATES LATITUDE. LO		J		MOBILE	097 01
30 30 50 025 0	NGITUDE 8 30.				
10 DIRECTIONS TO SITE (Starting from neares) public road!	FROM I	-10 4	THEODO	RE EXIT. T	AKE HWY 90W
HICKLIAN 163 (DOLFIN ISLAN	SLVD. (STOPE	LIGHT) TRAVEL	ABOUT 3	MILES TO
10 DIRECTIONS TO SITE IS LARING FORM PRATES PUBLIC (DATE EXIT ABOLIT J MI. TO HAMILTON E HIGHWAY 163 (DOLFIN ISLAN OVER CANAL AND TAILE 1ST RIGHT.	PANT LUCI	ATED	ATTHE EN	D OF ROAD ON	LEFT
III. RESPONSIBLE PARTIES			i		· · · · · · · · · · · · · · · · · · ·
O1 OWNER (If known)		02 STREE	(Business, melling, reside	entual)	
KAY- FRIES CHEMICALS,	INC.	En:	ST SIDE	RT. 9W	
03 CITY			05 7IP CODE	06 TELEPHONE NUMBER	
STONY TOINT		NY	10930	1914 1942-0400	
07 OPERATOR (If known and different from owner)		OB STREE	Tilliusiness meding, reside	nttal)	
KAY- FRIES, CHEMICALS	, INC	P.C	1 ZIP CODE	389	
09 CITY		_ 1		12 TELE PHONE NUMBER	1
THE ODORE		AL	36540	1205 653-5400	3
13 TYPE OF OWNERSHIP (Chin. 4 cha) A PRIVATE 11 B. FEDERAL.			. Li C. STATE	LID.COUNTY EFE.M	UNICIPAL
	(Ayency name)				3141017 AL
F OTHER Seed	(v)		() G. UNKNOW	YN .	
X A RCRA 3001 DATE RECEIVED 11 1918 ON YEAR	B. UNCONTROLL	ED WASTE	SITE (CERCLA 103 c)	DATE RECEIVED:	DAY YEAR
IV. CHARACTERIZATION OF POTENTIAL HAZARD					
XYES DATE 7 ,20,83 U.A.	eck eft thet anniv! EPA ! B. EPA				CONTRACTOR
NO MONTH DAY YEAR	LOCAL HEALTH OFFK	CIAL I	F. OTHER:	(Specify)	
	RACTOR NAME(S).				
SITE STATUS (Chrick one) **A ACTIVE F B INACTIVE F C UNKNOWN	UJ YLARS OF OPERA	1980	5 l	LI UNKNOW	/N
04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN		GINNING YE			
CORROSIVE, IGNITIVALE AND	REACTIVE L	W AST	S INVOL	VED IN MA	NUFACTURE"
OF LOW MOLECULAR WE	TIGHT ORE	FANIC	- CHEMICA	LS	
OS DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND NONE. THIS CUMPANY HAUNDER RORA REQUESTION	OR POPULATION	TED	DURING	ITS ENTIRE	HISTORY
UNDER BCRA REQUESTION	A PART	B	APPLICA	mon is in	I THE PROCESS
OF BEING CALLED.					
V. PRIORITY ASSESSMENT					
01 PRIORITY FOR INSPECTION (Check one If high or mindium is checked) 1.1. A. HIGH C. B. MEDIUM (Inspection required provide y) (Inspection required)	complete Part 2 - Waste Info-in CC: LOW (Inspection fellow)		D. NONE	ik Candinas and bu elenty) Cling anemed a confilete current dispo	รัปพาทิ ⁽ ติวาทา
VI. INFORMATION AVAILABLE FROM		 			
D1 CONTACT	02 OF (Agency Croams)	hin i			0.4 DILEPHONE NUMBER
STEVE MAURER	ADEM				4057271-7728
DONALEA DINSMORE	05 AGENCY	EP		1601 1922 8242	8 10 84

	$P\Delta$
~	

POTENTIAL HAZARDOUS WASTE SITE

I. IDENT			
O1 STATE	02 504	NUMBER	

\$EI	PA			ASSESSMEN		O1 STATE	02 SHE N	CIMBER
				EINFORMATIO	N			
	TATES, QUANTITIES, AN			Tablicade distance	TERM DOC	 		
A SOLID		musi on TONS	ITY AT SITE of wastu quantities enderwingenti	D3 WASTE CHARAC A TOXIC B CORRIC C RADIO D PERSI	OSIVE FINFECT PACTIVE G. FLAMM	E I IOUS . ABLE I	HIGHLY V I EXPLÓS K REACTI L INCOMP	IVE VE PATIBLE
: D OTHER	(Specify)						M NOT AP	PLICABLE
III. WASTE T	YPE							
CATEGORY	SUBSTANCE N	AMŁ	01 GRUSS AMOUNT	02 UNIT OF MEASUR	E 03 COMMENTS			
SLU	SLUDGE		ļ		<u> </u>			
OLW	OILY WASTE							
SOL	SOLVENTS							
PSD	PESTICIDES	·						
occ	OTHER ORGANIC CH	E MICALS		<u> </u>				
ЮС	INORGANIC CHEMIC	AL S						
ACD	ACIDS							
BAS	BASES							
MES	HEAVY METALS							
IV. HAZARDO	OUS SUBSTANCES 1500 AU	punita foi most frequent	tly cited CAS Numbers)					
01 CATEGORY	02 SUBSTANCE NA	ME	03 CAS NUMBER	04 STORAGE DIS	SPOSAL METHOD	DE CONCENTI	RATION	US MEASURE OF CONCENTRATION
	-							
			<u> </u>		- 		-	
			<u> </u>					
		· · · · · · · · · · · · · · · · · · ·						
								
								
					-			
		·				 		
						·		
								
	_							
	····							
V. FEEDSTO	CKS (See Appendix for CAS Number	3)						
CATEGORY	01 FEEDSTOCK	NAME	02 CAS NUMBER	CATEGORY	UI FLEDSTOC	K NAMF]	02 CAS NUMBER
FDS				FDS		-	- T	
FDS				FDS				
FDS				⊦DS				
FDS				FDS	·····			
VI. SOURCES	OF INFORMATION (CHe SL	ecific references, e.g.,	state files, saciable analysis in			·		
	FILES AND S				GARY Crisc	HONE	OF K	AV-Fer-
MUEN	LICES HAD ~	JINEF) (LUN VEKSATI	UN WITH	UAR!		')	"" - " KIES

ŞEPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT

	I. IDENTIFICATION					
1	01	STATE	02	SITE	NUMBER	

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)		·····	
01 D J DAMAGE TO FLORA 04 NARRATIVE DESCRIPTION	02 OBSERVED (DATE:)	□ POTENTIAL	() ALLEGED
01 ☐ K. DAMAGE TO FAUNA 04 NARRATIVE DESCRIPTION (Include name(s) of species)	02 [] OBSERVED (DATE:)	□ POTENTIAL	() ALLEGED
01 [] L. CONTAMINATION OF FOOD CHAIN 04 NARRATIVE DESCRIPTION	02 () OBSERVED (DATE:)	□ POTENTIAL	□ ALLEGED
01 M. UNSTABLE CONTAINMENT OF WASTES (Spetarimotivstending liquids feeking drums) 03 POPULATION POTENTIALLY AFFECTED:	02 © OBSERVED (DATE:) 04 NARRATIVE DESCRIPTION	☐ POTENTIAL	□ ALLEGED
01 (3 N DAMAGE TO OFFSITE PROPERTY 04 NARRATIVE DESCRIPTION	02 [] OBSERVED (DATE:)	□ POTENTIAL	□ ALLEGED
01 [] O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs 04 NARRATIVE DESCRIPTION	02 OBSERVED (DATE:)	☐ POTENTIAL	□ ALLEGED
01 (3 P. ILLEGAL/UNAUTHORIZED DUMPING 04 NARRATIVE DESCRIPTION	02 (] OBSERVED (DATE)	[] POTENTIAL	☐ ALLEGED
05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEG	ED HAZARDS		
II. TOTAL POPULATION POTENTIALLY AFFECTED: V. COMMENTS			
/. SOURCES OF INFORMATION (Clin specific references: e.g. state tites: sa	emale enelysis reparts)		

ŞEPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT

ı,	IDENT	TIFK	CAT	ION
01	STATE	02	SITE	NUMBER

PART 3 - DESCRIPTION OF H	AZARDOUS CONDITIONS AND INCIDEN	ts L	
II. HAZARDOUS CONDITIONS AND INCIDENTS			
01 T A. GROUNDWATER CONTAMINATION 03 POPULATION POTENTIALLY AFFECTED	02 i OBSERVED (DATE:) 04 NARRATIVE DESCRIPTION	[] POTENTIAL	□ ALLEGED
01 1 B SURFACE WATER CONTAMINATION 03 POPULATION POTENTIALLY AFFECTED	02 (OBSERVED (DATE:) 04 NARRATIVE DESCRIPTION	☐ POTENTIAL	[] ALLEGED
01 (1) C. CONTAMINATION OF AIR 03 POPULATION POTENTIALLY AFFECTED.	02 1 OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	() POTENTIAL	□ ALLEGED
01 □ D. FIRE/EXPLOSIVE CONDITIONS 03 POPULATION POTENTIALLY AFFECTED.	02 C OBSERVED (DATE:) 04 NARRATIVE DESCRIPTION	() POTENTIAL	(J ALLEGED
01 (1 E. DIRECT CONTACT 03 POPULATION POTENTIALLY AFFECTED.	02 () OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	E) POTENTIAL	C ALLEGED
01 L. F. CONTAMINATION OF SOIL 03 AREA POTENTIALLY AFFECTED. (Acres)	02 !_ OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	1 ! POTENTIAL	[] ALLEGED
01 L. G. DRINKING WATER CONTAMINATION 03 POPULATION POTENTIALLY AFFECTED:	02 (: OBSERVED (DATE	1) POTENTIAL	f.) ALLEGED
01 [H WORKER EXPOSURE/INJURY 03 WORKERS POTENTIALLY AFFECTED:	02 () OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	(J POTENTIAL	() ALLEGED
01 1: 1 POPULATION EXPOSURE/INJURY 03 POPULATION POTENTIALLY AFFECTED:	02 : i OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	() POTENTIAL	(ALLEGED

JUL 1 1 1984

4AW-IM



Cary Criscione
Kay-Pries, Inc.
P.O. Box 8d9
Theodore, Alabama 36590

EPA I.D. Number ALD 000 608 224

Dear Mr. Criscione:

A formal request for Part B of your application for a hazardous waste facility permit under the Resource Conservation and Recovery Act (RCPA) has been made or will be made in the near future. To assist applicants in the preparation of their applications, EPA, Pegion IV, Residuals Management Branch, will be conducting comprehensive reviews of the facility's ground-water monitoring program. Site visits will be conducted by Harding Lawson Associates under contract to Region IV. The data review and program evaluation will be made by EPA. The results of the evaluation will be used to inform the applicant of deficiencies in the facility's existing groundwater monitoring program and what actions the applicant will need to take to collect the data needed to comply with 40 CFR 270.14(c) requirements.

As discussed on July 9, 1984, Harding Lawson personnel will visit your facility on July 17, 1984 to collect the data needed for the evaluation. Harding Lawson will need to review the following items. Please have this information available at the time of the site visit.

- 1) Copy of the facility's current Part A.
- 2) Hydrogeologic and engineering report on the installation of the monitoring system.
- 3) Copy of the facility's groundwater sampling and analysis plan.
- 4) Copy of the facility's groundwater quality assessment plan if an assessment is being conducted.
- 5) A map or plate showing the layout of the facility.
- 6) Copies of all groundwater analysis.
- 7) Results of any statistical analysis.

Marding Lawson personnel will be collecting the dollowing site data:

- 1) Water level elevations from the monitoring cyclam.
- 2) Total depth of each well.
- 3) Relative elevation of each well.
- 4) Distance between monitoring wells.
- 5) Distance from regulated unit(s) to monitoring wells.

When the evaluation of your groundwater program has been completed, you will be informed of the results.

If you have any questions or comments regarding thes matter, please call Mr. Michael Arnett at 404/381-3007.

Sincerely yours,

James R. Scarbrough, Chief Nesiduals Fanagement Branch

co: Daniel E. Cooper / Alabama Department of Environmental Management

KAY-FRIES, ALABAMA, INC.

MIMBER Dynamil Nobel CROSS

June 15, 1984

Mr. Charles Flening Alabama Division of Solid and Hazardous Waste 434 Monroe Street Montgomery, AL 36130

Dear Mr. Fleming:

We are proposing to produce a new product, Hexamethyl Di Silizane (HMDS), in our silanes/silicates process (2004). The raw materials used to produce HMDS are trimethylchlorosilane and ammonia. During the reaction, trimethylchlorosilane is completely reacted. Ammonia is added to the reaction until the reaction mixture changes from an acidic nature to a basic one. Therefore, there may be a slight amount of excess ammonia. This ammonia is picked up in the Ammonium Chloride biproduct that is produced. The majority of the ammonium chloride produced during the reaction will be removed by centrifuging it in the silanes process area. However, there will be a slight amount of ammonium chloride (in a hexane water solution) that won't be centrifuged. This solution will be contained in a hold tank and pumped over to the orthoester process. Once in the orthoester process, the solution mixes with the orthoester ammonium chloride solution. At this time, the ammonium chloride is centrifuged while the excess water and hexane is sent to a stripper column. The stripper then separates the organic from the water taking the organic overhead and discharging the water out the bottom of the column to waste treatment. The organic that is taken overhead goes to a burn tank and is burned in our Thermal Osidizer.

Inclosed are the safety data sheets for the materials used and produced in this process. If you have any questions or need any further information, please feel free to contact me. Thank you for your cooperation.

Sincerely,

KAY-FRIES, INC.

Gary S. Criscione Production Manager

Fr. 21 A Comment



P.O. Box 889
Theodore, Alabama 36590
Telephone 205/653/5400

KAY-FRIES, ALABAMA, INC. MEMBER Dynamit Nobel GROUP

July 6, 1983

Mr. Mike Smith
Alabama Division of Solid
and Hazardous Waste
434 Monroe Street
Montgomery, AL 36130

Dear Mr. Smith:

Included in this Hazardous Waste Generator report is all the material we have sent to the Chemical Waste landfill in Emelle, Alabama. Please note that the majority of this material is not considered hazardous waste, but we are taking no chances with it and are sending it to Chemical Waste Management anyway along with the proper manifests.

Let me know if you need any further information or if you have any questions.

Sincerely,

KAY-FRIES, INC.

Gary S. Criscione Process Engineer

GSC/drh

cc: J. M. Edwards

R. H. Lance

WASTE GENERATOR REPORT (NONHAZARDOUS)

Kay-Fries, Inc.

DATE ISSUED	MANIFEST NUMBER	MATERIAL	AMOUNT AND WEIGHT
11/15/83	CWMA-70254	MTMS Salt IBTMO Salt	40 drums - 12,000 lbs 39 drums - 11,700 lbs
12/9/83	CWMA-70255	Ammonium Chloride MTMS Salt	9 drums - 2,700 lbs. 60 drums - 15,000 lbs
12/28/83	CWMA-70256	MTMS Salt CPTMO Salt	65 drums - 19,200 lbs 3 drums - 900 lbs.

WASTE GENERATOR REPORT (HAZARDOUS)

Kay-Fries, Inc.

DATE ISSUED	MANIFEST NUMBER	MATERIAL	AMOUNT AND WEIGHT
10/3/83	CWMA-70251	Filter Aid Sludge	47 drums - 14,100 lbs.
10/4/83	CWMA-70247	Silanes Reboiler Bottoms Holding Pond Sand and	34 drums - 10,200 lbs.
		Pea Gravel	79 drums - 55,300 lbs.
10/5/83	CWMA-70248	Holding Pond Sand and Pea Gravel	82 drums - 57,400 lbs.
10/6/83	CWMA-70249	Holding Pond Sand and	
10/10/83	· CWMA~70250	Pea Gravel Holding Pond Sand and	80 drums - 56,000 lbs.
	OH121 70230	Pea Gravel	80 drums - 56,000 lbs.
10/12/83	CWMA-70252	Holding Pond Sand and Pea Gravel	90 dames - 56 000 1hs
10/27/83	CWMA-70253	Holding Pond Sand and	80 drums - 56,000 lbs.
		Pea Gravel	8 drums - 4,800 lbs.
		Filter Aid Sludge	41 drums - 12,300 lbs.
		Silanes Reboiler Bottoms	34 drums - 10,500 lbs.
12/9/83	CWMA-70255	Filter Aid Sludge	28 drums - 8,400 lbs.
12/28/83	CWMA-70256	Silanes Reboiler Bottoms	21 drums - 8,400 lbs.

DATE ISSUED	MANIFEST NUMBER	MATERIAL	AMOUNT AND WEIGHT
4/1/83	CWMA-59619	Ammonium Chloride and Aeration Basin Sludge	16 yds ³ - 17,712 1b
4/21/83	CWMA-59620	Filter Aid Sludge	83 drms - 24,900 lb
5/4/83	CWMA-70233	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 1b
5/9/83	CWMA-70234	Ammonium Chloride Filter Aid Sludge	52 drms - 17,160 lb 31 drms - 9,300 lbs
5/12/83	CWMA-70235	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 lb
5/20/83	CWMA-70236	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 1b:
5/23/83	CWMA-70237	IBTMO Salt Ammonium Chloride	54 drms - 16,200 lb: 35 drms - 10,500 lb:
5/26/83	CWMA-70238	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 lbs
6/3/83	CWMA-70239	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 lb:
6/7/83	CWMA-70240	MTMS Salt Ammonium Chloride	63 drms - 15,750 lbs 24 drms - 7,200 lbs.

Date Issued	Manifest Number	Material	Amount and Weight
1/8/83	CWMA-59611	Ammonium Chloride and Aeration Basin Sludge	17 yds ³ - 18,819 lbs
1/12/83	CWMA-59612	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 lbs
1/15/83	CWMA-59613	Ammonium Chloride and Aeration Basin Sludge	17 yds ³ - 18,819 1bs
1/18/83	CWMA-59614	Ammonium Chloride and Aeration Basin Sludge	16 yds ³ - 17,712 1bs
1/21/83	CWMA-59615	Ammonium Chloride and Aeration Basin Sludge	17 yds ³ - 18,819 lbs
1/24/83	CWMA-59616	Ammonium Chloride and Aeration Basin Sludge	17 yds ³ - 18,819 1bs
2/9/83	CWMA-59617	CPTMO Salt Filter Aid Sludge	32 drums - 9,600 lbs 53 drums - 21,200 lbs
2/28/83	CWMA-59618	Ammonium Chloride and Aeration Basin Sludge	16 yds ³ - 17,712 1bs.

Date Issued	Manifest Number	<u>Material</u>	Amount and Weight
10/3/82	CWMA-44647	Ammonium Chloride and	17 yds ³ - 18,819 lbs.
10/8/82	CWMA-44648	Aeration Basin Sludge MTMS Salt Filter Aid Sludge	51 drums - 15,300 lbs. 31 drums - 12,400 lbs.
10/8/82	CWMA-44649	Ammonium Chloride Ammonium Chloride and Aeration Basin Sludge	13 drums - 3,900 lbs. 18 yds ³ - 19,926 lbs.
10/13/82	CWMA-44650	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 lbs.
10/17/82	CWMA-44651	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 lbs.
10/21/82	CWMA-59592	Ammonium Chloride and Aeration Basin Sludge	$18 \text{ yds}^3 - 19,926 \text{ lbs}.$
10/26/82	CWMA-59593	Ammonium Chloride	$18 \text{ yds}^3 - 19,926 \text{ lbs}.$
10/29/82	CWMA-59594	Ammonium Chloride	$16 \text{ yds}^3 - 17,712 \text{ lbs.}$
11/2/82	CWMA-64504	Ammonium Chloride and	17 yds ³ - 18,819 lbs.
	A	Aeration Basin Sludge	
11/4/82	CWMA-59596	MTMS Salt	60 drums - 18,000 lbs.
		Ammonium Chloride	36 drums - 10,800 lbs.
11/6/82	CWMA-59597	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 lbs.
11/10/82	CWMA-59598	IBTMO Salt	56 drums - 16,800 lbs.
11, 10, 01	021 33330	Ammonium Chloride	32 drums - 9,600 lbs.
		Filter Aid Sludge	8 drums - 3,200 lbs.
11/19/82	CWMA-59599	Ammonium Chloride and	$18 \text{ yds}^3 - 19,926 \text{ lbs}.$
11,13,02	Omat 37377	Aeration Basin Sludge	10 yds - 19,920 10s.
11/23/82	CWMA-59600	Ammonium Chloride and	$16 \text{ yds}^3 - 17,712 \text{ lbs.}$
11/23/02	CW124-33000	Aeration Basin Sludge	10 yds - 17,712 1bs.
11/29/82	CWMA-59601	Ammonium Chloride and	$18 \text{ yds}^3 - 19,926 \text{ lbs.}$
11, 23, 62	Qm21 37001	Aeration Basin Sludge	10 yds 17,720 103.
12/4/82	CWMA-59602	Ammonium Chloride and	18 yds ³ - 19,926 lbs.
, ,,		Aeration Basin Sludge	10,700 1000
12/8/82	CWMA-59603	Ammonium Chloride and	$18 \text{ yds}^3 - 19,926 \text{ lbs.}$
12,0,02	021 33003	Aeration Basin Sludge	10 yds- 17,720 103.
12/13/82	CWMA-59604	Ammonium Chloride and	$17 \text{ yds}^3 - 18,819 \text{ lbs.}$
12, 13, 02	J. 1004	Aeration Basin Sludge	17 yas 10,017 108.
12/17/82	CWMA-59605	Ammonium Chloride and	17 $yds^3 - 18,819$ lbs.
12, 1., 02		Aeration Basin Sludge	1, 343 10,013 100.
12/21/82	CWMA-59606	Ammonium Chloride and	$16 \text{ yds}^3 - 17,712 \text{ lbs.}$
12, 11, 01		Aeration Basin Sludge	10)45 17,712 155.
12/21/82	CWMA-59608	IBTMO Salt	14 drums - 4,200 lbs.
	J	Ammonium Chloride	74 drums - 22,200 lbs.
12/22/82	CWMA-59609	Filter Aid Sludge	83 drums - 33,200 lbs.
12/22/82	CWMA-59610	Ammonium Chloride and	16 yds ³ - 17,712 lbs.
12/30/02	CM:IW-23010		10 yas - 1/,/12 1bs.
		Aeration Basin Sludge	

Date Issued	Manifest Number	<u>Material</u>		Amount and Weight
7-2-82	CWMA-44629	Ammonium Chloride	19	cu.yds 21,033 lbs.
7-7-82	CWMA-44630	Ammonium Chloride	19	cu.yds 21,033 lbs.
7-14-82	CWMA-44631	Ammonium Chloride	19	cu.yds 21,033 lbs.
7-20-82	CWMA-44632	Ammonium Chloride	18	cu.yds 19,926 lbs.
8-10-82	CWMA-44633	Ammonium Chloride	18	cu.yds 19,926 lbs.
8-17-82	CWMA-44634	Ammonium Chloride	18	cu.yds 19,926 lbs.
8-21-82	CWMA-44635	Ammonium Chloride	18	cu.yds 19,926 lbs.
8-28-82	CWMA-44636	Ammonium Chloride & Aeration Basin Sludge	18	cu.yds 19,926 lbs.
9-2-82	CWMA-44637	MTMS Salt	88	drums - 26,400 lbs.
9-2-82	CWMA-44638	Ammonium Chloride	18	cu.yds 19,926 lbs.
9-3-82	CWMA-44639 1	Filter Aid Sludge	81	drums - 28,350 lbs.
9-7-82	CWMA-44640	Ammonium Chloride	18	cu.yds 19,926 lbs.
9-11-82	CWMA-44641	Ammonium Chloride	18	cu.yds 19,926 lbs.
9-15-82	CWMA-44642	Ammonium Chloride & Aeration Basin Sludge	17	cu.yds 18,819 lbs.
9-20-82	CWMA-44643	Ammonium Chloride & Aeration Basin Sludge	17	cu.yds 18,819 lbs.
9-21-82	CWMA-44644	Ammonium Chloride iBTMO Salt		drums - 5,300 lbs. drums - 20,700 lbs.
9-24-82	CWMA-44645	Ammonium Chloride	17	cu.yds 18,819 lbs.
9-28-82	CWMA-44646	Ammonium Chloride	17	cu.yds 18,819 lbs.

Date Issued	Manifest Number	Material	Amount and Weight
4/4/82	CWMA-31652	Ammonium Chloride	20 cu.yds 22,140 lbs.
4/8/82	CWMA-31653	Ammonium Chloride	19 cu.yds 21,033 lbs.
4/12/82	CWMA-31681	Ammonium Chloride	19 cu.yds 21,033 lbs.
4/16/82	CWMA-31682	Ammonium Chloride	19 cu.yds 21,033 lbs.
4/19/82	CWMA-31683	Ammonium Chloride	19 cu.yds 21,033 lbs.
4/23/82	CWMA-31684	Ammonium Chloride	19 cu.yds 21,033 lbs.
5/14/82	CWMA-44626	Ammonium Chloride	19 cu.yds 21,033 lbs.
6/25/82	CWMA-44627	Ammonium Chloride	19 cu.yds 21,033 lbs.
6/28/82	CWMA-44628	Filter Aid Sludge	80 drums - 28,000 lbs.

Date Issued	Manifest Number	<u>Material</u>	Amount and Weight
1-5-82	CWMA 30753	Ammonium Chloride	96 dr 28,800 lbs.
1-8-82	CWMA 30754	Ammonium Chloride	96 dr 28,800 lbs.
2-2-82	CWMA 30755	Ammonium Chloride	96 dr 28,800 lbs.
2-8-82	CWMA 31638	Ammonium Chloride	96 dr 28,800 lbs.
2-11-82	CWMA 31639	Filter Aid Sludge	80 dr 28,000 lbs.
2-19-82	CWMA 31640	Ammonium Chloride	96 dr 28,800 lbs.
2-19-82	CWMA 31641	Ammonium Chloride	88 dr 26,400 lbs.
3-1-82	CWMA 31642	Ammonium Chloride	21 cu. yds 23,247 lbs.
3-5-82	CWMA 31643	Ammonium Chloride	92 dr 27,600 lbs.
3-8-82	CWMA 31644 -	Ammonium Chloride	21 cu. yds 23,247 lbs.
3-9-82	CWMA 31645	Ammonium Chloride	20 dr 8,000 lbs.
		iBTMO Salt	76 dr 22,800 lbs.
3-14-82	CWMA 31646	Ammonium Chloride	21 cu. yds 23,247 lbs.
3-19-82	CWNA 31647	Ammonium Chloride	21 cu. yds 23,247 1bs.
3-22-82	CWMA 31648	Filter Aid Sludge	80 dr 28,000 lbs.
3-23-82	CWMA 31649	Ammonium Chloride	21 cu. yds 23,247 lbs.
3-27-82	CWMA 31650	Ammonium Chloride	21 cu. yds 23,247 lbs.
3-30-82	CWMA 31651	Ammonium Chloride	21 cu. yds 23,247 lbs.

U LINK UNIT



KAY-FRIES, INC. MEMBER Dynamil Nobel GROUP

December 15, 1982

Mr. Bernard E. Cox, Chief Hazardous Waste Section State of Alabama Dept. of Environmental Management State Capital Montgomery, AL 36130

> RE: Interim Hazardous Waste Permit EPA I.D. No. ALT 000608224

Dear Mr. Cox:

We are enclosing duplicate copies of Part A of the RCRA permit application covering our Kay-Fries Alabama, Inc. plant referenced above.

You will note that Form 3 of Part A is revised in the manner discussed with you and with Mr. John Harvanek of EPA, Region IV, to reflect regulatory revisions and processing changes that have occurred since the interim permit was effected.

The revisions are described as follows:

Form 3 - III Processes

Form 3, page 1 of 5, previously listed on line 4, an incinerator TO3 with capacity of .17 tons per hour and on line 2, a feed tank SO2 for the incinerator with capacity of 3000 gallons. These listings are removed because the equipment is actually a waste heat boiler supplying steam for processing, reference 40CFR 261.2 (b) (2). The waste which is burned is equivalent to 10,000 cu. ft. of natural gas and provides approximately 20% of the processing heat requirement.

2. Form 3 - IV Description of Hazardous Waste

Form 3, page 3 of 5, previously listed on line 1 - F005 1,196,000 pounds of waste for treatment in a surface impoundment. This designation is incorrect because the waste does not fit into any of the listed specific or non-specific hazardous waste categories. Based upon analysis, this stream should be listed as DOO2 Corrosive. The quantity has also been corrected to 2,883,000 pounds.



Form 3, page 3 of 5 previously listed on line 2, material which is part of the waste treated in the surface impoundment. It is deleted because it is included in line 1.

Form 3, page 3 of 5 previously listed on lines 3, 4, 5 and 6, streams which are burned in the waste heat boiler. These wastes are now deleted because the boiler is exempted under 40 CFR 261.2 (b) (2).

Form 3, page 3 of 5 of the revised application includes on line 2 a new listing of ignitable waste code D001 which is stored in drums and periodically shipped to the Chemical Waste Management secure landfill at Emelle, Alabama.

Form 3, page 3 of 5 of the revised application designates on line 3, a new listing of ignitable waste D001 which is collected in drums previous to treatment along with item 1 in the surface impoundment.

Form 3, page 3 of 5 of the revised application also includes on line 4 and 5, a new listing of waste material which is D002 Corrosive and D003 reactive with water. This material is collected in drums previous to treatment after which it is discharged to the surface impoundment of line 1.

We believe this revised application accurately portrays our waste situation. If you have any questions, please contact me at the above address, or Mr. Robert H. Lance, Plant Manager, Kay-Fries Alabama, Inc., P. O. Box 889, Theodore, Alabama 36590.

Very truly yours,

Edward S. Opdyke
Edward G. Opdyke

Executive Vice President

EGO:mja
Enclosures

cc: Mr. John M. Harvanek III, P.E.
Environmental Engineer, Reg. IV
United States Environmental
Protection Agency
345 Courtland St., N.E.
Atlanta, Georgia 30365



Jordon Jones & Goulding mc. Consu , Engineers

2000 CLEARVIEW AVE., N.E., SUITE 200, ATLANTA, GE., AGIA 30340, PHONE (404) 455-8555

PETERNER

APR 1 1960

March 24, 1980

BISHING A SECTION OF A YOUR PARK COLUMNS

Mr. Dan Cooper
Deputy Director
Division of Solid Waste & Vector Control
Environmental Health Adm.
State Office Building
Montgomery, Alabama 36130

Dear Mr. Cooper:

Thank you for the time you and your staff spent with me on February 8, 1980, discussing Alabama's current solid waste disposal regulations. To review our interest, Kay-Fries, Inc. is planning to construct an organic chemical manufacturing facility in the Theodore Industrial Park, Theodore, Alabama, and will generate a sludge from their biological wastewater treatment facility. Current plans are to dewater this sludge and dispose of the dried cake at an offsite location. Our firm, Jordan, Jones & Goulding, Inc., is providing Kay Fries with consulting engineering services in several areas, including applications for permits from the appropriate regulatory agencies.

Since your previous correspondence with Kay-Fries in May, 1978, the production aspect of their proposed plant has been modified. Current plans are to produce a group of organic chemical intermediates, specifically orthoformates and silanes. Start-up of the manufacturing facility is scheduled for spring, 1981. The process wastewater, as well as rainfall from some potentially contaminated areas such as pump pads and around storage tanks, will be collected and treated in an activated sludge treatment system at a rate of 50 gpm. Excess waste activated sludge will be dewatered using a filter press to an expected cake solids content of 30-40 percent. Sludge conditioning with lime and ferric chloride will aid in achieving this easily handled cake.

To confirm our discussion, the Federal regulations regarding classification and disposal of hazardous wastes (40 CFR 250) are currently in a proposed form, although EPA is slated to issue a final version within a few months. The Alabama Department of Public Health will modify their regulations to reflect the Federal version. In summary, if the dewatered sludge is classified as hazardous, disposal in a secured landfill is required. If the waste is classified as non-hazardous, Kav-Fries has the option of using an approved on-site landfill or an off-site sanitary landfill, the nearest one being in Irvington, Alabama.

As you know, the only available sludge for testing purposes is from a bench scale treatability study being conducted at Kay-Fries' New York plant. While mixed liquor solids are available, a dewatered sludge representative of the filter press cake is not.

It is estimated, based on assumed sludge production and decay coefficients, that 197 lbs./dav of excess dry solids will be generated from the activated sludge treatment plant. Following chemical addition and dewatering, there will be 1150 lbs./day, or 16 cu. ft./dav of dewatered cake to dispose of in a landfill.

In reviewing the proposed hazardous waste regulations dated December 13, 1978, Kay Fries' sludge is not classified as hazardous under sections 250.14 (a) or (b). Furthermore, none of the parameters identified under 250.13 (d) (2) (ii) for toxic wastes are used in their manufacturing process. Based on the available information and the proposed regulations, it does not appear that Kay Fries' sludge will be classified as hazardous. It is suggested, because the Federal and State regulations relative to hazardous waste disposal are not final and are likely to change before the plant begins operation and hecause any testing done now would have to be repeated on the dewatered sludge from the full scale operation, that Kay-Fries forego further analysis of their sludge for the purpose of determining whether or not it is hazardous. Once the full scale plant is in operation, Kay-Fries will make the necessary analyses in accordance with regulations current at that time to determine whether or not their sludge is classified as hazardous. Any necessary permits for disposal of the sludge will also be obtained at that time.

By taking this course of action, Kay-Fries assumes that they will be given adequate time to get their waste treatment plant functioning properly and to perform the necessary testing of their sludge. Your written concurrence with this course of action is requested. Kay-Fries recognizes its responsibility to provide for the safe disposal of this sludge and will comply with Federal or State laws and regulations regarding sludge disposal. Please let me know if any further information is needed at this time.

Very truly yours,

JORDAN, JONES & GOULDING, INC.

and the second

Don Allen

DA/bj

cc: Boh Lance George Bitler Dr. Ken Kelly

with the state of


rennevivania 15108 Phone (412) 262 1035

Laboratory Analysis Report

Kay Fries Alabama, Inc.

Samples Received:

12/11/81

Report Date:

3/8/82

Source	Sludge Sample Clarifier Overflow
Log No. 81- Date Collected	7532 12/10/81
pH Flash Point, *F Reactivity Corrosivity	8.8 >200 Non-Reactive Non-Corrosive
Methanol, mg/L Total Cyanide, mg/L CN Amenable Cyanide, mg/L CN Acetonitrile, mg/L Diethyl Benzene, mg/L Ethanol, mg/L Dimethyl Ether, mg/L Methyl Formate, mg/L	1,099 1.78 0.074 2.6 70.3 <1.0 <1.0
Ethyl Formate, mg/L Ethyl Chloride, mg/L Methyl Acetate, mg/L Methylene Chloride, mg/L Triethyl Orthoformate, mg/L Trimethyl Orthoformate, mg/L Trimethyl Orthoacetate, mg/L Chloride, mg/L Cl	<1.0 <1.0 <1.0 0.012 <1.0 <1.0 <1.0 <1.0 <2,050
PH Arsenic, mg/L As Barium, mg/L Ba Cadmium, mg/L Cd Chromium, mg/L Cr Lead, mg/L Pb Mercury, mg/L Hg Selenium, mg/L Se Silver, mg/L Ag	7.0 <0.001 0.2 0.01 0.02 <0.02 <0.001 <0.001

[.] Unless otherwise noted, analyses are in accordance with methods and procedures outlined and approved by the Environmental Protection Agency and conform to quality assurance protocol.

^{• &#}x27;Less than' (<) values are indicative of the detection limit.

mobile Co. July 10, 1979 Kay-Fries Chemicals, Inc. Stony Point New York, New York 10980 Attention: Mr. Stephen A. Turek Senior Project Engineer Dear Mr. Turek: We are in receipt of a permit application for refuse disposal for your proposed plant in Theodore Industrial Park, Mobile County, Alabama. The permit application was submitted to us by Mr. James W. McInnis, Jr., Mobile County Health Department, for proper processing. The information contained in the permit application for refuse disposal does not sufficiently detail waste streams in question, therefore, we must request that more information regarding the expected quantity and chemical characteristics of each waste stream involved be forwarded to this office for review. The requirement for waste stream analysis was previously addressed in Mr. Dan E. Cooper's letter of May 25, 1978, to Dr. Kenneth W. Kelley, of your firm. A copy of Mr. Cooper's letter is enclosed for your information and use. If you should have any questions, please contact us. Our telephone number 1s (205) 832-6728. Sincerely,

Wade Pitchford & ...
Public Health Engineer
Division of Solid Waste & Vector Control
Environmental Health Administration

GWP:clr

Enclosure

CC: Mr. James W. McInnis

Mobile County Health Department



CDM FEDERAL PROGRAMS CORPORATION

November 1, 1990

Mr. Doyle Brittain Work Assignment Manager U.S. Environmental Protection Agency 345 Courtland Street Atlanta, GA 30365

PROJECT:

EPA Contract No.: 68-W9-0004

DOCUMENT NO:

TES7-R04019-EP-BZDK

SUBJECT:

Draft RCRA Facility Assessment Report for WA R04019

Kay-Fries Incorporated Site, Theodore, Alabama

Document No. TES7-R04019-DR-BZDL-2

Dear Mr. Brittain:

This letter documents the transmittal of the above referenced TES VII document as partial fulfillment of the reporting requirements for work assignment R04019. Two copies are enclosed for your convenience.

If you have any questions or comments regarding this submittal, please contact Tony Isolda, or myself at (404) 952-7393, within two weeks of receipt of this letter.

Sincerely,

CDM FEDERAL PROGRAMS CORPORATION

Abel B. Dunning

TES VII Region IV Manager

TI/ABD/ln

cc: Jean Wright, EPA HQ TES VII Zone Project Officer

Rowena Sheffield, EPA Regional Project Officer, RCRA Region IV w/encl

mar maria

D. Casmack, ADEM w/encl

Frances Hallahan, SAIC w/encl

Jim Levin, A.T. Kearney

Constance V. Braun, FPC Program Manager

Document Control (2)

File TES7/R04019

- APPENDIXD

OVERSIZED DOCUMENT

Site Investigation Kay Fries, Inc. Mobile County, Alabama EPA ID # ALD000608224

Prepared by

Alabama Department of Environmental Management Field Operations Division

July 1994

K. FRIES

APPENDIX C

SITE INSPECTION WORKSHEETS

CHIEFE IN

This appendix consists of worksheets that can be used to generate an SI site score. Completion of these worksheets is not required, but the SI investigator must evaluate an SI score, either by these worksheets, *PREscore*, or other Regional scoring tools.

The worksheets consist of instructions and data tables to be filled in with scores from HRS reference tables. The data tables may also call for Data Type and References.

DATA TYPE: The Data Type columns should be filled in with an H, Q, or + if the data are HRS quality and well documented. The Data Type column should be filled in with an E, X, or - if the data represent estimates, approximations, or are not fully documented. This type identifies data gaps for the expanded SI to investigate.

REFERENCES: The Reference columns should be filled in with coded reference numbers. The numbered reference list should be attached or the numbering should be cross-referenced to the SI Narrative Report.

The SI investigator will need the current Superfund Chemical Data Matrix (SCDM) OSWER Directive 9345.1-13 (revised semi-annually) to complete these worksheets.

11/1/13/0/1/12g

SITE INSPECTION WORKSHEETS

CERCLIS IDENTIFICATION NUMBER

SITE L	OCATION		
SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAM			
K-FRIES STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION II	DENTIFIER		
STREET ADDRESS, NOOTE, OTTO, EST TO LOCATION II			
CITY	STATE	ZIP CODE	TELEPHONE
MOBILE COORDINATES: LATITUDE and LONGITUDE	AL		,
COORDINATES: LATITUDE and LONGITUDE	TOWNSHIP, RAN	IGE, AND SECTION	ON
30 31.023 89 08.404	T 6 5 /	Kahl	
OWNER/OPERATOR	R IDENTIFICAT	TION	
OWNER	OPERATOR		
HULS OWNER ADDRESS	HULS OPERATOR ADD	nece	
OWNER ADDRESS	OPERATOR ADD	ncoo	
CITY	CITY		
STATE ZIP CODE TELEPHONE ()	STATE	ZIP CODE	TELEPHONE ()
SITE EVA	LUATION		
AGENCY/ORGANIZATION			
ADEM			
INVESTIGATOR			
CN SCOTT			
ADDRESS			
1751 DICKINSON BLUD	STATE		171B CODE
MONTGONIERY	STATE AL		ZIP CODE 36/30
ELEPHONE 205) 260-2700		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	

GENERAL INFORMATION

Site Description and Operational History: Provide a brief description of the site and its operational history. State the site name, owner, operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note whether these activities are documented or alleged. Identify all source types and prior spills, floods, or fires. Summarize highlights of the PA and other investigations. Cite references.

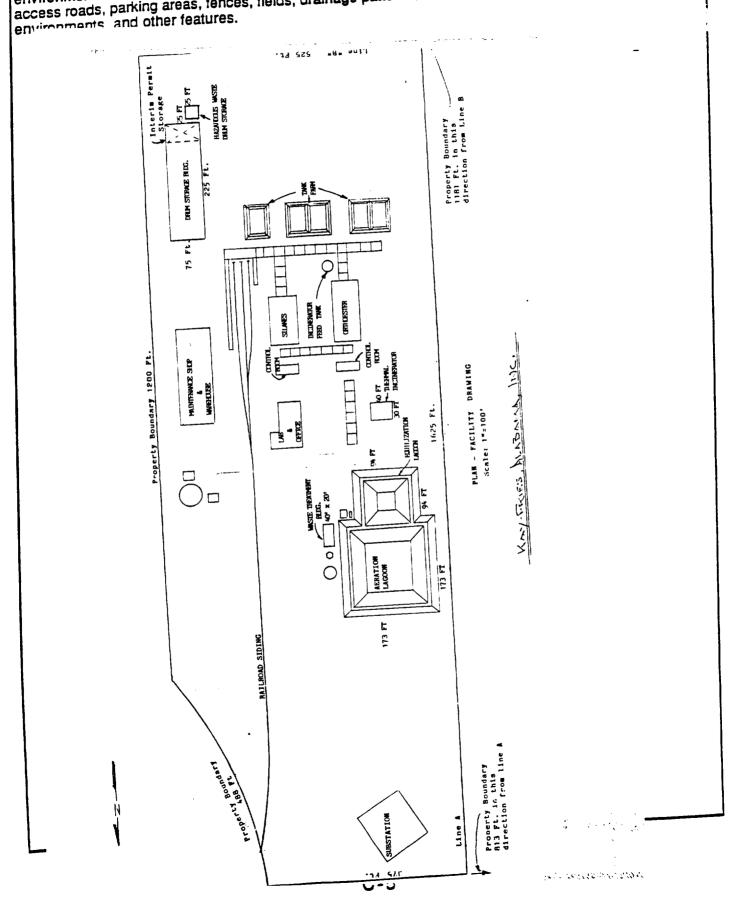
Kay Fries site is an active regulated site (RCRA, CWA and CAA) at this writing doing business as Huls America, Inc. The facility is located on a 160 acre tract of land in the Theodore Industrial Park, about 15 miles south of Mobile Alabama. Kay Fries was acquired and reorganized in 1988 and the name changed to Hul America, Inc. at that time. Kay Fries manufactures organic chemical intermediates which typically include orthoesters and organo-functional silanes as intermediary reagents for the chemical and pharmaceutical industries. Major starting reagents or feedstocks utilized by Kay Fries include methanol, ethanol, acetonitrile, cyanide, diethylbenzene, silicon tetrachloride, trichlorosilane, additional silanes and acids.

The site is located in Mobile County south of Theodore, section 23 of Township 6 South, Range 2 West. at a the approximate coordinates: latitude 30° 30′ 45″ and longitude 88° 08′ 30″. Generally, the setting is industrial with several other large chemical or manufacturing facilities within 3 miles of Kay Fries. Suburban areas associated with Theodore/Mobile exist in the 1 mile to 4 mile radii, primarily toward the north west. Other inhabited areas include the community of South Orchard, located 3 to 4 miles south of the site. Dykes Creek is located adjacent to the sites eastern side with associated wetlands and Muddy Creek is located approximately 0.6 miles to the west of the facility.

Production of isophorones and other pharmaceutical/agricultural precursors from raw products or feedstocks including: methanol, ethanol, acetonitrile, cyanide, diethylbenzene, silicon tetrachloride and silanes. Groundwater sampling conducted with regard to this site revealed the presence of diethylbenzene releases to groundwater that was attributable to the equalization basin and the aeration basins. A closure plan for the two basins was submitted in June 1986 and amended October 1986. The units were approved clean closed by ADEM December 1987, however the units were not certified clean closed. Both units are still operational as of March 1994, although they no longer manage hazardous waste.

GENERAL INFORMATION (continued)

Site Sketch: Provide a sketch of the site. Indicate all pertinent features of the site and nearby environments including sources of wastes, areas of visible and buried wastes, buildings, residences, access roads, parking areas, fences, fields, drainage patterns, water bodies, vegetation, wells, sensitive environments, and other features.



GENERAL INFORMATION (continued)

Source Descriptions: Describe all sources at the site. Identify source type and relate to waste disposal operations. Provide source dimensions and the best available waste quantity information. Describe the condition of sources and all containment structures. Cite references.

SOURCE TYPES

Landfill: A man-made (by excavation or construction) or natural hole in the ground into which wastes have come to be disposed by backfilling, or by contemporaneous soil deposition with waste disposal.

Surface Impoundment: A natural topographic depression, man-made excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold an accumulation of liquid wastes, wastes containing free liquids, or sludges not backfilled or otherwise covered; depression may be wet with exposed liquid or dry if deposited liquid has evaporated, volatilized or leached; structures that may be described as lagoon, pond, aeration pit, settling pond, tailings pond, sludge pit; also a surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled).

Drum: A portable container designed to hold a standard 55-gallon volume of wastes.

Tank and Non-Drum Container: Any device, other than a drum, designed to contain an accumulation of waste that provides structural support and is constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic); any portable or mobile device in which waste is stored or otherwise handled.

Contaminated Soil: An area or volume of soil onto which hazardous substances have been spilled, spread, disposed, or deposited.

Pile: Any non-containerized accumulation above the ground surface of solid, non-flowing wastes; includes open dumps. Some types of waste piles are:

Chemical Waste Pile:

A pile consisting primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks.

• Scrap Metal or Junk Pile:

A pile consisting primarily of scrap metal or discarded durable goods (such as appliances, automobiles, auto parts, batteries, etc.) composed of materials containing hazardous substances.

· Tailings Pile:

A pile consisting primarily of any combination of overburden from a mining operation and tailings from a mineral mining.

beneficiation, or processing operation.

• Trash Pile:

A pile consisting primarily of paper, garbage, or discarded non-

durable goods containing hazardous substances.

Land Treatment: Landfarming or other method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

Other: Sources not in categories listed above.

GENERAL INFORMATION (continued)

Source Description: Include description of containment per pathway for ground water (see HRS Table 3-2), surface water (see HRS Table 4-2), and air (see HRS Tables 6-3 and 6-9).

Production of isophorones and other pharmaceutical/agricultural precursors from raw products or feedstocks including: methanol, ethanol, acetonitrile, cyanide, diethylbenzene, silicon tetrachloride and silanes. Groundwater sampling conducted with regard to this site revealed the presence of diethylbenzene releases to groundwater that was attributable to the equalization basin and the aeration basin. A closure plan for the two basins was submitted in June 1986 and amended October 1986. The units were approved clean closed by ADEM December 1987, however the units were not certified clean closed. Both units are still operational as of March 1994, although they no longer manage hazardous waste. Previous groundwater contamination concerns have been corrected and contaminants have disipated to below detection limits or below RCRA levels.

Attach additional pages, if necessary

HWQ =

HAZARDOUS WASTE QUANTITY (HWQ) CALCULATION

For each migration pathway, evaluate HWQ associated with sources that are available (i.e., incompletely contained) to migrate to that pathway. (Note: If Actual Contamination Targets exist for ground water, surface water, or air migration pathways, assign the calculated HWQ score or 100, whichever is greater, as the HWQ score for that pathway.) For each source, evaluate HWQ for one or more of the four tiers (SI Table 1; HRS Table 2-5) for which data exist: constituent quantity, wastestream quantity, source volume, and source area. Select the tier that gives the highest value as the source HWQ. Select the source volume HWQ rather than source area HWQ if data for both tiers are available.

Column 1 of SI Table 1 Indicates the quantity tier. Column 2 lists source types for the four tiers. Columns 3, 4, 5, and 6 provide ranges of waste amount for sites with only one source, corresponding to HWQ scores at the tops of the columns. Column 7 provides formulas to obtain source waste quantity values at sites with multiple sources.

- 1. Identify each source type.
- 2. Examine all waste quantity data available for each source. Record constituent quantity and waste stream mass or volume. Record dimensions of each source.
- 3. Convert source measurements to appropriate units for each tier to be evaluated.
- 4. For each source, use the formulas in the last column of SI Table 1 to determine the waste quantity value for each tier that can be evaluated. Use the waste quantity value obtained from the highest tier as the quantity value for the source.
- 5. Sum the values assigned to each source to determine the total site waste quantity.
- 6. Assign HWQ score from SI Table 2 (HRS Table 2-6).

Note these exceptions to evaluate soil exposure pathway HWQ (see HRS Table 5-2):

- The divisor for the area (square feet) of a landfill is 34,000.
- The divisor for the area (square feet) of a pile is 34.
- Wet surface impoundments and tanks and non-drum containers are the only sources for which volume measurements are evaluated for the soil exposure pathway.

SI TABLE 2: HWQ	SCORES FOR SITES
Site WQ Total	HWQ Score
0	0
1ª to 100	1 b
> 100 to 10.000	100
> 10.000 to 1 million	10,000
> 1 million	1,000.000

a if the WQ total is between 0 and 1, round it to 1.

b If the hazardous constituent quantity data are not complete, assign the score of 10.

SI	TABLE 3:	WASTE	CHARACTERIZATION	WORKSHEET
U	I ABLL V.	117016	OHAHAO I EHIEA HOR	II VIII/OIILLI

•

					SURFACE WATER PATHWAY										
SOURCE	HAZARDOUS SUBSTANCE				WATER							GROUND WATER TO SURFACE WATER			
			GW Mobility (HRS Table 3-8)	Tox/ Mobility Value (HRS Table 3-9)	Per (HRS Tables 4-10 and 4-11)	Tox/Per Value (HRS Table 4-12)	Bloac Pot. (HRS Table 4-15)	Tox/ Pers/ Bioac Value (HRS Table 4-16)	Ecotox (HRS Table 4-19)	Ecotox/ Pers (FIRS Table 4-20)	Ecotox/ Pers/ Bioacc Value (14RS Table 4-21)	Tox/ Mob/ Pers Value (HRS Table 4-26)	Tox/ Mob/ Pers/ Bioacc Value (HRS Table 4-28)	Ecotox/ Mob/ Pers Value (HRS Table 4-29)	Ecotox/ Mob/ Per/ Bioacc - Value () IPIS Table 4-30)
	Et		1		1	10	₹0	4	190	70	2000				
	21		/	10000	1	100.00	5000	5×107	1,000	1000	5×106	10000	· γ 7	13000	.7
			<u> </u>		<u> </u>		<u> </u>	<u> </u>			1	1	<u> </u>	\	<u> </u>
<u> </u>								<u> </u>	_			1			
	_		_	<u> </u>		<u> </u>									
												<u> </u>	<u> </u>		
				<u> </u>				<u> </u>				1			
					_	_		<u> </u>		_					
			_		_			<u> </u>							
<u> </u>	_			_											
ļ	_		_		_	_	_								
<u> </u>					_l									_	

Ground Water Observed Release Substances Summary Table

On Si Table 4, list the hazardous substances associated with the site detected in ground water samples for that aquifer. Include only those substances directly observed or with concentrations significantly greater than background levels. Obtain toxicity values from the Superfund Chemical Data Matrix (SCDM). Assign mobility a value of 1 for all observed release substances regardless of the aquifer being evaluated. For each substance, multiply the toxicity by the mobility to obtain the toxicity/mobility factor value; enter the highest toxicity/mobility value for the aquifer in the space provided.

Ground Water Actual Contamination Targets Summary Table

If there is an observed release at a drinking water well, enter each hazardous substance meeting the requirements for an observed release by well and sample ID on SI Table 5 and record the detected concentration. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population using the well as a Level I target. If these percentages are less than 100% or all are N/A, evaluate the population using the well as a Level II target for that aquifer.

GROUND WATER PATHWAY GROUND WATER USE DESCRIPTION

Describe Ground Water Use within 4 Miles of the Site:

Describe generalized stratigraphy, aquifers, municipal and private wells

The site is located in the Alluvial-Deltaic Plains physiographic section. The major underlying formation is the Miocence Series, undifferentiated, which is composed of gray, orange and red fine to course grained sand, red ferruginous sandstone, and sandy silty clay. The top of the aquifer generally occurs 125 to 150 feet below the land surface, with individual sand beds being 50 to 100 feet thick. Groundwater in this aquifer is recharged by precipitation in areas west and north of the facility. The water table aquifer may discharge to local streams and form swamps in topographic lows, such as near Dykes Creek to the east. Sand and gravel units are generally too thin around the facility for significant aquifer usage. However, small quantities of good quality water are available for domestic use.

The monitoring well system at the facility consists of one upgradient and four down gradient wells drilled to a depth greater than or equal to 30 feet. Two additional wells exist, both downgradient that were drilled to a depth of 10 feet. In October 1985 diethylbenzene was found at significant levels in the shallow well (#6) and again in November 1987 the same well yielded 379 ug/L (ppb) during a compliance monitoring inspection. The same well yielded 410 ug/L during an April 1988 test. Since this time the analyte level has decreased with time and is no longer a RCRA concern.

Within four miles of the site, are several industrial water supply wells and one public water supply well. The public well belongs to the Mobile County Water and is about three miles north of the site. This well is 148 feet deep and screened in the alluvium. Mobile County Water Works services 3,920 connections (2.5 persons/connection based on county average) or about 9,800 individuals.

calculations for bler	nded supply sys	tems.		•
CONNECTIONS	x 2.71	\sim	9,100	
			,	
				•
	calculations for blei er of persons per h	calculations for blended supply syser of persons per household:	calculations for blended supply systems. er of persons per household: 2.7/ Re	calculations for blended supply systems. er of persons per household:

GROUND WATER PATHWAY WORKSHEET

LIKELIHOOD OF RELEASE	Score	Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation]	
support a release to the aquifer, assign a score of 550. Record	1 2 4 0		
observed release substances on SI Table 4.			-
2. POTENTIAL TO RELEASE: Depth to aquifer:feet. If		1	ļ
sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a	1		
score of 500; otherwise, assign a score of 340. Optionally,	İ		
evaluate potential to release according to HRS Section 3.			
LR =	12.7	1	
7456776			
Are any wells part of a blended system? Yes_/_ No			
If yes, attach a page to show apportionment calculations.	}		
in yes, attach a page to their appointment datediations.			
3. ACTUAL CONTAMINATION TARGETS: If analytical evidence		1	
indicates that any target drinking water well for the aquifer has been			
exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5).		1	
factor score for the number of people served (or rable by.		ł	
Level I: people x 10 =	ł	- 1	
Level II: people x 1 = Total =			
4. POTENTIAL CONTAMINATION TARGETS: Determine the number	İ	1	
of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the	ĺ	l	
site; record the population for each distance category in SI Table 6a		- 1	
or 6b. Sum the population values and multiply by 0.1.	41.7		
5. NEAREST WELL: Assign a score of 50 for any Level I Actual			
Contamination Targets for the aquifer or overlying aquifer. Assign a	3	- 1	
score of 45 if there are Level II targets but no Level I targets. If no		1	
Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles.	γ	1	
assign 0.			
6. WELLHEAD PROTECTION AREA (WHPA): If any source lies			
within or above a WHPA for the aquifer, or if a ground water		- 1	ļ
observed release has occurred within a WHPA, assign a score of			- 1
20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0.	0	- 1	1
7. RESOURCES: Assign a score of 5 if one or more ground water			
resource applies; assign 0 if none applies.		1	- 1
Irrigation (5 acre minimum) of commercial food crops or			
commercial forage crops • Watering of commercial livestock			
 Watering of confinercial livestock Ingredient in commercial food preparation 		ĺ	1
Supply for commercial aquaculture			
 Supply for a major or designated water recreation area, 			
excluding drinking water use	0	j	
	772 5		
Sum of Targets T=	43.7		

SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS

SI Table 6a: Other Than Karst Aquifers

Nearest	Well =	2	i										_ :	Sum =	417	
>3 to 4 miles		(2)	0.3	1	4	13	42	131	417	1,306	4,171	13,060	41,709	130,596	4/7	
> 2 to 3 miles		3	0.5	2	7	21	68	212	678	2,122	6,778	21,222	67,777	212,219		
> 1 to 2 miles		5	0.7	3	10	30	94	294	939	2,939	9,385	29,384	93,845	293,842		
> 1/2 to 1 mile		9	1	5	17	52	167	523	1,669	5,224	16,684	52,239	166,835	522,385		
$>\frac{1}{4}$ to $\frac{1}{2}$ mile		18	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122		
0 to $\frac{1}{4}$ mile		20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455		
Distance from Site	Рор.	Nearest Well (choose highest)	1 10 10	11 to 30	31 to 100	101 10 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,000 to 3,000,000	Pop. Value	Ref.
							Populati	on Serve	d by Well	s within Di	stance Cat	egory				

7-16

GROUND WATER PATHWAY WORKSHEET (concluded)

WA	STE CHARACTERISTICS	Score	Data Type	Does not Apply
8.	If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to ground water.	100		
9.	Assign the highest ground water toxicity/mobility value from SI Table 3 or 4.	19,000 A		
10.	Multiply the ground water toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7)			
	Product WC Score 0 0 >0 to <10 1 10 to <100 2 100 to <1,000 3 1,000 to < 10,000 6 10,000 to <1E + 05 10 1E + 05 to <1E + 06 18 1E + 06 to <1E + 08 56 1E + 08 or greater 100			
	WC =	32		

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the ground water pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

GROUND WATER PATHWAY SCORE:

LR X T X WC 82,500

(Maximum of 100)

550 × 43,7×32 = 22,500

SURFACE WATER PATHWAY

Sketch of the Surface Water Migration Route: Label all surface water bodies. Include runoff route and drainage direction, probable point of entry, and 15-mile target distance limit. Mark sample locations, intakes, fisheries, and sensitive environments. Indicate flow directions, tidal influence, and rate. LAURENCINE RD 9,000

Sample ID	Hazardous Substance	Bckgrd. Conc.	Taxicity/ Persistence	Toxicity/ Persis./ Bioaccum	Ecotoxicity/ Persis/ Ecobioaccum	References		
							1	
							·	
	н	ighest Values		l		<u> </u>		
I TABLE 8	: SURFACE WATER	DRINKING	WATER ACT	TUAL CONT	MINATION	TARGETS		
itake ID:	Sample Type	·	Lev	/el I	Level II	Population Served	Referen	ces
			Benchmark		Occasa Diale	% of Cancer		
Sample ID	Hazardous Substance	Conc. (µg/L)	Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	Risk Conc.	RfD	% of RID
	•	_1	l l	1	1	.]		<u> </u>
			Highest		Sum of		Sum of	Į.
	-1		Highest Percent		Sum of Percents		Sum of Percents	
Intake ID:	Sample Ty) 0		avel (Population Serve	Percents	ences
Intake ID:	Sample Ty		Percent Lo	1	Percents Level II	T	Percents	onces
Intake ID:	Sample Typ	Conc.	Percent Lo	% of	Level II	Population Serve % of Cancer Risk Conc.	Percents	
		Conc.	Percent Lo Benchmark Conc.	% of	Level II	% of Cancer	Percents dRefere	
		Conc.	Percent Lo Benchmark Conc.	% of	Level II	% of Cancer	Percents dRefere	
Intake ID: Sample ID		Conc.	Percent Lo Benchmark Conc.	% of	Level II	% of Cancer	Percents dRefere	
		Conc.	Percent Lo Benchmark Conc.	% of	Level II	% of Cancer	Percents dRefere	% of RfD

SURFACE WATER PATHWAY LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

	LIKELINOOD OF RELEASE AND DRI	WING ANIE	11111111111111111111		
	IKELIHOOD OF RELEASE- OVERLAND/FLOOD MIGRATION		Score	Data Type	Refs
	 OBSERVED RELEASE: If sampling data or dire support a release to surface water in the watersh of 550. Record observed release substances on 	ed, assign a score			
2	. POTENTIAL TO RELEASE: Distance to surface if sampling data do not support a release to surface watershed, use the table below to assign a score below based on distance to surface water and flo	ce water in the from the table			
	Distance to surface water <2500 feet	500	İ	ļ	
1	Distance to surface water >2500 feet, and:				ŀ
ł	Site in annual or 10-yr floodplain	500	1		Ì
	Site in 100-yr floodplain	400	Ì		
1	Site in 500-yr floodolain	300	1	1	
	Site outside 500-yr floodplain	100			
	Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2)ase 			
		LR =	300]	
	War was an Art British			Deta	
	KELIHOOD OF RELEASE Round water to surface water mig	RATION	Score	Data Type	Refs
	OBSERVED RELEASE: If sampling data or direct		T	1,12	7
	support a release to surface water in the watershed of 550. Record observed release substances on \$	d, assign a score			
NC	TE: Evaluate ground water to surface water migration surface water body that meets all of the following of				
1)	A portion of the surface water is within 1 mile of site a containment factor greater than 0.	sources having	·		
2)	No aquifer discontinuity is established between the above portion of the surface water body.	e source and the			
3)	The top of the uppermost aquifer is at or above the	bottom of the			

2. POTENTIAL TO RELEASE: Use the ground water potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2.

LR =

surface water.

Elevation of top of uppermost aquifer Elevation of bottom of surface water body

SI TABLE 9 (From HRS Table 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY

						Numb	er of	people				
Type of Surface Water Body	Pop.	Nearest Intake	0	1 to 10	11 to 30	31 to 100	101 to 300	to	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	Pop. Value
Minimal Stream (<10 cfs)		20	0	4	17	53	164	522	1,633	5,214	16,325	
Small to moderate stream (10 to 100 cfs)		2	0	0.4	2	5	16	52	163	521	1,633	
Moderate to large stream (> 100 to 1,000 cls)		0	0	0.04	0.2	0.5	2	5	16	52	163	
Large Stream to river (>1,000 to 10,000 cfs)		0	0	0.004	0.02	0.05	0.2	0.5	2	5	16	
Large River (> 10,000 to 100,000 cfs)		0	0	0	0.002	0.005	0.02	0.05	0.2	0.5	16	
Very Large River (>100,000 cfs)		0	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	
Shallow ocean zone or Great Lake (depth < 20 feet)		0.	0	0	0.002	0.005	0.02	0.05	0.2	0.5	2	
Moderate ocean zone or Great Lake (Depth 20 to 200 feet)		0	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	
Deep ocean zone or Great Lake (depth > 200 feet)		0	0	0	0	0	0.001	0.003	0.008	0.03	0.08	
3-mile mixing zone in quiet flowing river (≥ 10 cfs)		10	0	2	9	26	82	261	817	2,60	7 8,163	
Nearest	intake =	NA								•	Sum =	7)

References _____

SURFACE WATER PATHWAY

Human Food Chain Actual Contamination Targets Summary Table

On SI Table 10, list the hazardous substances detected in sediment, aqueous, sessile benthic organism tissue, or fish tissue samples (taken from fish caught within the boundaries of the observed release) by sample ID and concentration. Evaluate fisheries within the boundaries of observed releases detected by sediment or aqueous samples as Level II, if at least one observed release substance has a bioaccumulation potential factor value of 500 or greater (see SI Table 7). Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For FDAAL benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate this portion of the fishery as subject to Level I concentrations. If the percentages are less than 100% or all are N/A, evaluate the fishery as a Level II target.

Sensitive Environment Actual Contamination Targets Summary Table

On SI Table 11, list each hazardous substance detected in aqueous or sediment samples at or beyond wetlands or a surface water sensitive environment by sample ID. Record the concentration. If contaminated sediments or tissues are detected at or beyond a sensitive environment, evaluate the sensitive environment as Level II. Obtain benchmark concentrations from SCDM. For AWQC/AALAC benchmarks, determine the highest percentage of benchmark of the substances detected in aqueous samples. If benchmark concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage equals or exceeds 100%, evaluate that part of the sensitive environment subject to Level I concentrations. If the percentage is less than 100%, or all are N/A, evaluate the sensitive environment as Level II.

hery ID:	Sam	ple Type		Level	1	Level II	References	
Sample ID	Hazardous Substance	Conc. (mg/kg)	Benchmark Concentration (FDAAL)	% of Benchmark	Cancer Risk Concentration.	% of Cancer Risk Concentration	RID	% of RID
			Highest Percent		Sum of Percents		Sum of Percents	
			•			0. 500		L
	I: SENSITIVE ENVI D:Sa						ENSHED Environment Va	ulue
Sample ID	Hazardous Substance	Conc (µg/L)	Benchmark Concentration (AWQC or AALAC)	% of Benchmark	References			
								
		1	Highest Percent					
Environment (ID: s	ample Type _	<u> </u>	Lev	vel 1	Level II	_ Environment \	/alue
Sample ID	Hazardous Substance	Conc (µg/L)	Benchmark Concentration (AWQC or AALAC)	% of Benchman	k References			
								}
								ï
			Highest Percent					

SURFACE WATER PATHWAY (continued) ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

EN\	IRONMENT	AL T	HEAT TARGE	TS			Score	Data Type	Refs
	sensitive envir If there is no s	onmen ensitive	y type and flow for t within the target environment with the bottom of the	distant in the i	e (see S	I Table 12).		
Envir	onment Name		Water Body Type	9	F	ow		- [1
							s		1
	 					a	is		1
			-			cf	s	- 1	
 			-			cf	s	- [1
 							-4		1
Si ei Si	ampling data on the control of the c	or direct is been informa	TION SENSITIVE : observation indic exposed to a haz tion on SI Table 1	ate any ardous	y sensitiv s substai assign a	re nce from th factor	ne .		
Va	alue for the en	vironme	ent (SI Tables 13	and 14					
Enviro	nment Name	Enviro Value	nment Type and (SI Tables 13 & 14)	Multip Level	lier (10 to	Product			
		 		Lavel	11)	 	-	l	1 1
 				×		╡			1 1
ll				×					
				x			1		
				^		1	1		
L				X		6	4		
10. PC	TENTIAL CO	NTAMII	NATION SENSITI	VE EN	VIRONM	Sum =			
							_[}
Flow	Dilution Weig (SI Table 12)	nt	Environment Type Value (SI Tables 1	and 3 & 14)	Pat. Cont.	Product	#	1 1	
-4-							1		
cts		X		<u>X</u>	0.1 =				1
cfs		×	 	X	0.1 =				
cfs		x		x	0.1 =			1 1	
cfs		x			0.1 =				
cfs		X I		X	0.1 =	Sum =			
						Juin =	2		
						T =	2		

SI TABLE 13 (HRS TABLE 4-23): SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

SENSITIVE ENVIRONMENT	ASSIGNED VALUE
Critical habitat for Federal designated endangered or threatened species	100
Marine Sanctuary	1
National Park	j
Designated Federal Wilderness Area	1
Ecologically important areas identified under the Coastal Zone Wilderness Act	
Sensitive Areas identified under the National Estuary Program or Near Coastal	1
Water Program of the Clean Water Act	
Critical Areas identified under the Clean Lakes Program of the Clean Water Act	ĺ
(subareas in lakes or entire small lakes)	1
National Monument (air pathway only)	
National Seashore Recreation Area	
National Lakeshore Recreation Area	
Habitat known to be used by Federal designated or proposed endangered or threatened species	75
National Preserve	
National or State Wildlife Refuge	
Unit of Coastal Barrier Resources System	
Coastal Barrier (undeveloped)	
Federal land designated for the protection of natural ecosystems	
Administratively Proposed Federal Wilderness Area	
Spawning areas critical for the maintenance of fish/shellfish species within a	
river system, bay, or estuary	
Migratory pathways and feeding areas critical for the maintenance of	
anadromous fish species within river reaches or areas in lakes or coastal	
tidal waters in which the fish spend extended periods of time	
Terrestrial areas utilized by large or dense aggregations of vertebrate animals	
(semi-aquatic foragers) for breeding	j
National river reach designated as recreational	
labitat known to be used by State designated endangered or threatened species	50
labitat known to be used by a species under review as to its Federal endangered	ſ
or threatened status	
Coastal Barrier (partially developed)	1
ederally designated Scenic or Wild River	
itate land designated for wildlife or game management	25
tate designated Scenic or Wild River	
tate designated Natural Area	ì
articular areas, relatively small in size, important to maintenance of unique biotic communities	
tate designated areas for the protection of maintenance of aquatic life under the Clean Water	5
ct	
/etlands See SI Table 14 (Surface Water Pathway) or SI Table 23 (Air Pathway)	

SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

Total Length of Wetlands	Assigned Value
Less than 0.1 mile	0
0.1 to 1 mile	25
Greater than 1 to 2 miles	50
Greater than 2 to 3 miles	75
Greater than 3 to 4 miles	100
Greater than 4 to 8 miles	150
Greater than 8 to 12 miles	250
Greater than 12 to 16 miles	350
Greater than 16 to 20 miles	450
Greater than 20 miles	500

SURFACE WATER PATHWAY (concluded) WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS . Score If an Actual Contamination Target (dri iking water, human food chain, or environmental threat) exists or the watershed, assign the calculated hazardous waste quantity score, or a score of 100, 100 whichever is greater. 15. Assign the highest value from SI Table 7 (observed release) or SI Table 3 (no observed release) for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat. WC Score (from Table) Substance Value HWQ Product filiaximum of 1007 **Drinking Water Threat** 106 Cd: 10000 Toxicity/Persistence 100 Food Chain Threat Cd = Toxicity/Persistence 100 Bioaccumulation -x107 100 Environmental Threat 21 Ecotoxicity/Persistence/ 5x 108 100 5×106 Ecobioaccumulation 00 Product WC Score 0 1 >0 to <10 2 10 to <100 100 to <1,000 3 1,000 to < 10,000 6 10.000 to <1E + 05 10 1E + 05 to <1E + 06 18 1E + 06 to <1E + 07 32 1E + 07 to <1E + 08 56 1E + 08 to <1E + 09 100 1E + 09 to <1E + 10 180 1E + 10 to <1E + 11 320 1E + 11 to <1E + 12 560 1E + 12 or greater 1000

SURFACE WATER PATHWAY THREAT SCORES

Threat	Likelihood of Release (LR) Score	Targets (T) Score	Pathway Waste Characteristics (WC) Score (determined above)	Threat Score <u>LR x T x WC</u> 82,500
Drinking Water	300	0	. 34	(maximum of 100)
Human Food Chain		2 . :	180	(maximum of 100)
Environmental		D	100	(maximum of 60)

SURFACE WATER PATHWAY SCORE (Drinking Water Threat + Human Food Chain Threat + Environmental Threat)

(maximum of 100)

SOIL EXPOSURE PATHWAY WORKSHEET RESIDENT POPULATION THREAT

	KELIHOOD OF EXPOSURE	Score	Type	Refs
1.	OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0.			
L				
	LE =			
TA	RGETS			
2.	RESIDENT POPULATION: Determine the number of people			
	occupying residences or attending school or day care on or within 200 feet of areas of observed contamination (HRS section 5.1.3).			
1	Level I: people x 10	j	1	1 1
	Level II: people x 1 = Sum =	\		
3.	RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I			
1	resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (i.e.,		1	1 1
	no Level I or Level II targets), assign 0 (HRS Section 5.1.3).			
4.	WORKERS: Assign a score from the table below for the total			
	number of workers at the site and nearby facilities with areas of observed contamination associated with the site.			
l	Number of Workers Score			
l	0		1 1	
	1 to 100 5		1 1	i
	101 to 1,000 10		1 1	j
	>1,000 15	70	1 1	1
5.	TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for		 	
	each terrestrial sensitive environment (SI Table 16) in an area of			- 1
(observed contamination.		1 1	1
				ſ
	Terrestrial Sensitive Environment Type Value		1 1	- 1
			1 1	İ
			1 1	
			1 1	
				1
	Sum =	,		1
6. F	RESOURCES: Assign a score of 5 if any one or more of the			
fc	ollowing resources is present on an area of observed			
Q	ontamination at the site; assign 0 if none applies.			
:	Commercial agriculture Commercial silviculture	1		}
	Commercial livestock production or commercial livestock	ſ		
	grazing	, i		
		97		
	Total of Targets T=			

SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

TERRESTRIAL SENSITIVE ENVIRONMENT	ASSIGNED VALUE
Terrestnal critical habitat for Federal designated endangered or threatened species	100
National Park	
Designated Federal Wilderness Area	
National Monument	
Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species National Preserve (terrestrial)	75
National or State terrestrial Wildlife Refuge	
Federal land designated for protection of natural ecosystems	
Administratively proposed Federal Wilderness Area	Į.
Terrestrial areas utilized by large or dense aggregations of animals	ł
(vertebrate species) for breeding	į
Terrestrial habitat used by State designated endangered or threatened species Terrestrial habitat used by species under review for Federal designated endangered or threatened status	50
State lands designated for wildlife or game management	25
State designated Natural Areas	į
Particular areas, relatively small in size, important to maintenance of	
unique biotic communities	

SOIL EXPOSURE PATHWAY WORKSHEET NEARBY POPULATION THREAT

	LIKELIHOOD OF EXPOSURE	Score	Type	Ref.
	7. Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6) Value			
	Area of Contamination (from Si Table 18 or HRS Table 5-7) Value			
L	Likelihood of Exposure (from SI Table 19 or HRS Table 5-8)			
	LE =	D		
т	ARGETS	Score	Data Type	Ref.
_	ARGETS Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated.	Score	Data Type	Ref.
_	Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated.	Score		Ref.

SI TABLE 17 (HRS TABLE 5-6): ATTRACTIVENESS/ACCESSIBILITY VALUES

Area of Observed Contamination	Assigned Value
Designated recreational area	100
Regularly used for public recreation (for example, vacant lots in urban area)	75
Accessible and unique recreational area (for example, vacant lots in urban area)	75
Moderately accessible (may have some access improvements—for example, gravel road) with some public recreation use	50
Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use	25
Accessible with no public recreation use	10
Surrounded by maintained fence or combination of maintained fence and natural barriers	5
Physically inaccessible to public, with no evidence of public recreation use	. 0

SI TABLE 18 (HRS TABLE 5-7): AREA OF CONTAMINATION FACTOR VALUES

Total area of the areas of observed contamination (square feet)	Assigned Value
≤ to 5,000	5
> 5,000 to 125,000	20
> 125,000 to 250,000	40
> 250,000 to 375,000	60
> 375,000 to 500,000	80
> 500,000	100

SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

AREA OF CONTAMINATION	ATTRACTIVENESS/ACCESSIBILITY FACTOR VALUE							
FACTOR VALUE	100	75	50	25	10	5	0	
100	500	500	375	250	125	50	0	
80	500	375	250	125	50	25	0	
60	375	250	125	50	25	5	0	
40	250	125	50	25	5	5	0	
20	125	50	25	5	5	5	0	
5	50	25	5	5	5	5	0	

SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

Travel Distance Category (miles)	Pop.	Number of people within the travel distance category												
		0	1 to 10	11 to 30	31 to 100	101 to 300	to	1,001 to 3,000	to	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	Pop. Value
Greater than 0 to $\frac{1}{4}$		0	0.1	0.4	1.0	4	13	41	130	408	1,303	4,081	13,034	
Greater than $\frac{1}{4}$ to $\frac{1}{2}$		0	0.05	0.2	0.7	2	7	20	65	204	652	2,041	6,517	
Greater than $\frac{1}{2}$ to 1		0	0.02	0.1	0.3	1	3	10	33	102	326	1,020	3,258	
	Reference(s) Sum											Sum =		

SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

WAS	TE CHARACTERISTICS			
10.	Assign the hazardous waste	quantity score c	alculated for soil expo	sure
11.	Assign the highest toxicity va	lue from SI Table	e 16	
12.	Multiply the toxicity and hazar Waste Characteristics score f Product 0 >0 to <10 10 to <100 100 to <1,000 1,000 to <1,000 10,000 to <1E + 05 1E + 05 to <1E + 06 1E + 06 to <1E + 07 1E + 07 to <1E + 08 1E + 08 or greater	rdous waste quarrom the table belong the table belong to the table belong to the table belong the table belong to table belong to the table belong to the table belong to table belong to	ow:	WC =
(Likeliho	ENT POPULATION THRE cod of Exposure, Question 1; = Sum of Questions 2, 3, 4, 5,		LE X T X WC 82,500	
NEARB	Y POPULATION THREAT	SCORE:		
	od of Exposure, Question 7; - Sum of Questions 8, 9)		LE X T X WC 82,500	
	XPOSURE PATHWAY SC nt Population Threat + Ne		on Threat	(Maximum of 100)

SITE SCORE CALCULATION	8	92
GROUND WATER PATHWAY SCORE (SGW)	1.32	86.86
SURFACE WATER PATHWAY SCORE (Sew)	13,10	171,61
SOIL EXPOSURE (Sg)	0	
AIR PATHWAY SCORE (SA)	0	
SITE SCORE $\sqrt{\frac{S_{GW}^2 + S_{SW}^2 + S_S^2 + S_A^2}{4}}$	•	8,04

COMMENTS		
1		
·		
	·	
	·	
_		
•		
		1
	•	

REGION: 04 STATE: AL

U.S. ENVIRONMENTAL PROTECTION AGENCY OFFICE OF EMERGENCY AND REMEDIAL RESPONSE C E R C L I S V 1.2

PAGE: 1 RUN DATE: 07/16/87 RUN TIME: 18:16:47

M.2 - SITE MAINTENANCE FORM

			* ACTION: _			
EPA ID : ALD000608224						
SITE NAME: KAY FRIES INC		SOURCE: H	*	 		. <u>-</u>
STREET : THEODORE INDUST	RIAL PARK	CONG DIST: 01	•			
CITY : THEODORE		ZIP: 36590	*			
CNTY NAME: MOBILE		CNTY CODE : 097	*			
LATITUDE : 30/30/30.0	LONGIT	UDE : 088/08/30.0	·//			//
LL-SOURCE: R		LL-ACCURACY:	• _			_
SMSA : 5160	HYD	RO UNIT: 03160205	*			
INVENTORY IND: Y REMEDIAL	IND: Y REMOVAL IND:	N FED FAC IND: N	• _	-	_	_
NPL IND: N NPL LISTING	DATE: NPL DELI	STING DATE:	• _	/	_/_	
SITE/SPILL IDS:			*			
RPM NAME:	RPM PH	ONE:	*			
SITÉ CLASSIFICATION:	s	ITE APPROACH:	• —			
DIOXIN TIER:	REG FLD1:	REG FLD2: 1	•			_
RESP TERM: PENDING ()	NO FURTHER ACTION	(X)	• PENDING (_)		NO FURTHER	ACTION (_)
ENF DISP: NO VIABLE RESP ENFORCED RESPO	PARTY () VOLUN ONSE () COST	TARY RESPONSE () RECOVERY ()	:= =			
SITE DESCRIPTION:						
			*			
			*	· · · · · · · · · · · · · · · · · · ·		
			*			
			•			

REGION: 04 STATE : AL

U.S. ENVIRONMENTAL PROTECTION AGENCY OFFICE OF EMERGENCY AND REMEDIAL RESPONSE C E R C L I S V 1.2

PAGE: 2 RUN DATE: 07/16/87 RUN TIME: 18:16:47

M.2 - PROGRAM MAINTENANCE FORM

	* ACTION: _
ITE: KAY FRIES INC	
PA ID: ALD000608224 PROGRAM CODE: H01 PROGRAM TYPE:	•
ROGRAM QUALIFIER: ALIAS LINK :	·
ROGRAM NAME: SITE EVALUATION	*
ESCRIPTION:	
	*
	•
	*

REGION: 04 STATE : AL

U.S. ENVIRONMENTAL PROTECTION AGENCY OFFICE OF EMERGENCY AND REMEDIAL RESPONSE C E R C L I S V 1.2

PAGE: 3 RUN DATE: 07/16/87 RUN TIME: 18:16:47

M.2 - EVENT MAINTENANCE FORM

			• ACTION: _		
SITE: KAY F PROGRAM: SITE	RIES INC Evaluation				
EPA ID: ALDOO	0608224 PROGRAM CODE: H01	EVENT TYPE: DS1			
FMS CODE:	EVENT QUALIFIER :	EVENT LEAD: E	• _		·
EVENT NAME: DESCRIPTION:	DISCOVERY	STATUS:	*		- ,
			*		
			*		
ORIGINAL	CURRENT	ACTUAL			
START:	START:	START:	• _/_/_	_/_/_	_/_/_ '
COMP :	COMP :	COMP : 08/01/80	• _/_/_	//	/
HQ COMMENT:			•		
RG COMMENT:			*		
COOP AGR #	AMENDMENT # STATUS	STATE %			
		0	*		

REGION: 04 STATE : AL

U.S. ENVIRONMENTAL PROTECTION AGENCY OFFICE OF EMERGENCY AND REMEDIAL RESPONSE C E R C L I S V 1.2

PAGE: 4 RUN DATE: 07/16/87 RUN TIME: 18:16:47

M.2 - EVENT MAINTENANCE FORM

			• ACTION: _		
SITE: KAY F PROGRAM: SITE	RIES INC Evaluation				
EPA ID: ALDOO	0608224 PROGRAM CODE: H01	EVENT TYPE: PA1			
FMS CODE:	EVENT QUALIFIER :	EVENT LEAD: S	• _		-
EVENT NAME: DESCRIPTION:	PRELIMINARY ASSESSMENT	STATUS:	*		-
			*		
			*		
ORIGINAL	CURRENT	ACTUAL			
START:	START:	START: 09/01/84	*//	_/_/_	_/_/_
COMP :	COMP :	COMP : 10/01/84	* _/_/_	//_	_/_/_
HQ COMMENT:			•		
RG COMMENT:			*		
COOP AGR #	AMENDMENT # STATUS	STATE %			
		0	*		

SEPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT

I. IDENTIFICATION
OF STATE OF SITE NUMBER
AL DOOGEOSAA 4

PART 1 - SITE INFORMA	TION AND ASSESSMENT					
II. SITE NAME AND LOCATION						
O1 SITE NAME (Legal, common, or descriptive name of site)	102 STREET ROUTE NO OR SPECIFIC LOCATION IDENTIFIER (P.D. Bex 889)				
KAY-FRIES CHEMICALS, INC	THEODORE INDUSTRIAL PAR	K				
03 City	04 STATE 05 ZIP CODE 06 COUNTY	07COUNTY 08 CONG CODE DIST				
THEODORE	AL 36580 MOBILE	097 01				
30 30 30 . 088 08 30 .						
10 DIRECTIONS TO SITE (Starting from neares) public road! EXIT FROM I	-10 AT THEODORE EXIT. TA	EXE HWY 90W				
ABOUT 3 MI. TO HAMILTON BLVD. (STOP HIGHWAY 163 (DOLFIN ISLAND PARKWAY OVER CANAL AND THILE 1ST RIGHT. PAANT LOC	LIGHT) TRAVEL ABOUT 3 N Y) TURN RIGHT. TRAVEL 1.5 ATED ATTHE END OF ROAD ON	LEFT TO				
III. RESPONSIBLE PARTIES						
01 OWNER (Micrown)	02 STREET (Business: malling, residential)					
KAY- FRIES CHEMICALS, INC.	EAST SIDE KT. 9W					
STONY POINT	04 STATE 05 ZIP CODE 08 TELEPHONE NUMBER 10980 1914 1942-0400					
07 OPERATOR (Il known and different from owner)	08 STREET (Business: mailing, residential)					
KAY-FRIES, CHEMICALS, INC	10 STATE 11 ZIP CODE 12 TELE PHONE NUMBER					
09 CITY	1 1					
THEODORE	AL 36540 1205 653-5400					
13 TYPE OF OWNERSHIP (Check one) A. PRIVATE [] B. FEDERAL: (Agency name)	J U. C. STATED COUNTY C. E. MU	NICIPAL				
F OTHER(Specify)	☐ G. UNKNOWN					
14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)	LED WASTE SITE (CERCLA 103 c) DATE RECEIVED	/ Li C. NONE				
IV. CHARACTERIZATION OF POTENTIAL HAZARD						
01 ON SITE INSPECTION BY (Check all that approx)	A CONTRACTOR XC STATE LID OTHER	CONTRACTOR				
★YES DATE 7,20,83 □ A. EPA □ B. EPA □ B. EPA □ B. EPA □ B. EPA □ B. EPA □ B. EPA		CONTRACTOR				
CONTRACTOR NAME(S).	[SUBCTY!					
02 SITE STATUS (Check one) 03 YEARS OF OPER						
A. ACTIVE FIB INACTIVE FIC UNKNOWN	1980 : UNKNOW BEGINNING YEAR ENDING YEAR	N				
04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN OR ALLEGED CORROSIVE, TENITABLE AND KEACTIVE	WASTES INVOLVED IN MAN	JUFACTURE"				
OF LOW MOLECULAR WEIGHT OR	GANIC CHEMICALS					
OS DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION NONE. THIS COMPANY HAS OPERATED DURING ITS ENTIRE HISTORY UNDER RCRA REQULATION, A PART B APPLICATION IS IN THE PROCESS OF BEING CALLED.						
V. PRIORITY ASSESSMENT						
01 PRIORITY FOR INSPECTION (Check one If high or medium is checked - omplete Part 2 - Wasta Into ination and Fart 3 - Description of Huzardous Conditions and the Hurb.)						
L' A HIGH L' B MEDIUM C. C. LOW D. NONE Unspection required promptly: Unspection required to the time disable basis (No further action needed to replete current disposition form)						
VI. INFORMATION AVAILABLE FROM						
01 CONTACT O2 DF (Ayency trigant)	alimi	CO TELEPHONE NUMBER				
STEVE MAURER HDEN	TOP ARCANUATION	205 271-7728				
O4 PERSON RESPONSIBLE FOR ASSESSMENT US AGENCY DONA LEA DINSMORE	EPS (60): 922 \$242	B 10 84				

2	FPΔ

I. IDENT	TIFICATION
U1 STATE	02 SHE NUMBER

ŞEF	PA	PO		ASSESSMENT	•	UI STATE 02 SHE N	UMBER
				E INFORMATION	<u> </u>		
	TATES, QUANTITIES, AN	02 WASTE QUANT	 	Too waste Charact	ERISTICS (Check a) trata		····
I A SOLID I B POWDE	. E SLUR RY ER, FINES — F. LIQ UID	:Measures must be TONS	TITY AT SITE of waste quantilles e indep endent:	A TOXIC B CORRO C RADIOA D PERSIS	SIVE F INFEC	BLE I HIGHLY VITIOUS J EXPLOSI MABLE K. REACTIVABLE L L INCOMP	IVE VE PATIBLE
C. D. OTHER	(Specify)					i M NOT AP	PLICABLE
III. WASTE T	YPE						
CATEGORY	SUBSTANCE N	IAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS		
SLU	SLUDGE						
OLW	OILY WASTE	*****					
SOL	SOLVENTS				<u> </u>		
PSD	PESTICIDES				<u> </u>		
occ	OTHER ORGANIC CH	HEMICALS					
ЮС	INORGANIC CHEMIC	CALS					
ACD	ACIDS						
BAS	BASES						
MES	HEAVY METALS		<u></u>			. <u>.</u>	
	OUS SUBSTANCES (See A)			Υ		·	T CONFICURE OF
01 CATEGORY	02 SUBSTANCE N	IAME	03 CAS NUMBER	04 STORAGE DIS	POSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
				ļ	• • • • • • • • • • • • • • • • • • • •		ļ
				<u> </u>			
					·		
							Γ
V. FEEDSTO	CKS (See Appendix for CAS Numbi	pers)		<u> </u>			<u> </u>
CATEGORY			02 CAS NUMBER	CATEGORY	O1 FEEDSTO	OCK NAME	02 CAS NUMBER
FDS				FDS			······································
FDS			+	FDS			
FDS				⊦DS			
FDS				FDS			
	S OF INFORMATION (CHO	specific references, e.g.	state liles, semple analysis,	<u> </u>	 		
ADEM	FILES AND	S	N		GARY Cris	SCHONE OF !	Zav-Farme
MUEM	FILES MND	JIMPP)	CONVERDAL	10W WITH	GAR!	,)71-1 KIE3

POTENTIAL HAZARDOUS WASTE SITE

I. IDENTIFICATION

	NARY ASSESSMENT ZARDOUS CONDITIONS AND INCIDENTS	01 STATE 02	SITE NUMBER
II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)			
01 J DAMAGE TO FLORA 04 NARRATIVE DESCRIPTION	02 D OBSERVED (DATE:)	☐ POTENTIAL	() ALLEGED
01 D K. DAMAGE TO FAUNA 04 NARRATIVE DESCRIPTION (Include name(s) of species)	02 (OBSERVED (DATE:)	☐ POTENTIAL	□ ALLEGED
01 D L. CONTAMINATION OF FOOD CHAIN 04 NARRATIVE DESCRIPTION	02 OBSERVED (DATE:)	☐ POTENTIAL	[] ALLEGED
01 (I M. UNSTABLE CONTAINMENT OF WASTES (Spillstranoff/standing liquids/leaking drums) 03 POPULATION POTENTIALLY AFFECTED:	02 OBSERVED (DATE:	☐ POTENTIAL	C ALLEGED
01 [] N. DAMAGE TO OFFSITE PROPERTY 04 NARRATIVE DESCRIPTION	02 [] OBSERVED (DATE:)	POTENTIAL	□ ALLEGED
01 O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs 04 NARRATIVE DESCRIPTION	02 OBSERVED (DATE)	☐ POTENTIAL	□ ALLEGED
01 P. ILLEGAL/UNAUTHORIZED DUMPING 04 NARRATIVE DESCRIPTION	02 (3 OBSERVED (DATE)	[] POTENTIAL	☐ ALLEGED
05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEC	GED HAZARDS		
III. TOTAL POPULATION POTENTIALLY AFFECTED:IV. COMMENTS			
V. SOURCES OF INFORMATION (Cite specific references, e.g. state tites, s	sample analysis (apous)		

POTENTIAL HAZARDOUS WASTE SITE

		TIFICAT	
01	STATE	02 SITE	NUMBER

PART 3 - DESCRIP	PRELIMINARY ASSESSMENT PTION OF HAZARDOUS CONDITIONS AND INCIDENTS		
N. HAZARDOUS CONDITIONS AND INCIDENTS			·
01 A GROUNDWATER CONTAMINATION 03 POPULATION POTENTIALLY AFFECTED	02 D OBSERVED (DATE:) 04 NARRATIVE DESCRIPTION	POTENTIAL	□ ALLEGED
01 B. SURFACE WATER CONTAMINATION 03 POPULATION POTENTIALLY AFFECTED:	02 G OBSERVED (DATE:) 04 NARRATIVE DESCRIPTION	□ POTENTIAL	() ALLEGED
01 □ C. CONTAMINATION OF AIR 03 POPULATION POTENTIALLY AFFECTED	02 () OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	☐ POTENTIAL	∰ ALLEGED
01 D. FIRE/EXPLOSIVE CONDITIONS 03 POPULATION POTENTIALLY AFFECTED:	02 C. OBSERVED (DATE:) 04 NARRATIVE DESCRIPTION	[] POTENTIAL	t ! ALLEGED
01 © E. DIRECT CONTACT 03 POPULATION POTENTIALLY AFFECTED:	02 □ OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	E POTENTIAL	. ALLEGED
01 C F. CONTAMINATION OF SOIL 03 AREA POTENTIALLY AFFECTED: (Acres)	02 : J OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	⊕ POTENTIAL	C) ALLEGED
01 G DRINKING WATER CONTAMINATION 03 POPULATION POTENTIALLY AFFECTED:	02 L: OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	D POTENTIAL	C) ALLEGED
01 (1) H WORKER EXPOSURE/INJURY 03 WORKERS POTENTIALLY AFFECTED:	02 () OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	() POTENTIAL	() ALLEGED
01 LEL POPULATION EXPOSURE/INJURY 03 POPULATION POTENTIALLY AFFECTED:	02 : OBSERVED (DATE) 04 NARRATIVE DESCRIPTION	[] POTENTIAL	i ALLEGED

Site Name: KAY- FRIES CHEMICALS, INC.
Site Number: ALDOOO 608224
Owner: KAY-FRIES CHEMICALS, INC.
Operator: ICAY - FRIES CHEMICALS, INC.
Site Status: Active Inactive Unknown
Priority: High Medium Low None
,
3. FINAL DISPOSITION
I. EPS Final Review - Date: 8/13/84 Comments:
A.
Site Inspection Required / Yes /X/ No
II. ADEM Review - Date: 9/7/84 Scm Comments:
Follow-up Action Required / Yes / No
III. Final Disposition: Review & revise Date: Edited & correct Date: Transmitted Date: File close-out Date:
Initiate site inspection Date:
4. ADDITIONAL COMMENTS (ONGOING & FINAL)
TO THE BEST OF OUR KNOWLEDGE THIS IS
A RORA FACILITY ONLY.
A KORA PACILITY DNUT.

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT EPS FORM 3012-III

INDUSTRIAL NARRATIVE SHEET

1. Site Identification:

Site number: ALD000608224

Site name: Kay-Fries Chemicals, Inc.

Site county: Mobile

Industrial Narrative Summary:

Company Name: Kay-Fries Chemicals

Address: P.O. Box 889

Theodore, Al. 36590

Telephone No.: 205-653-5400

Contact: Gary Criscione

Discussion: This plant was constructed in 1980 and is involved in manufacture of organic chemicals. Since the time that construction was proposed, they have worked with the ADEM office to assure compliance with environmental requirements. Conversations with ADEM staff indicate that this company has chosen to abide by much more stringent requirements than required to avoid any future problems. They are eligible for regulatory exemptions, however they have chosen not to take advantage of them. They are currently preparing the Part B application for submission in November of 1984. When the site was under construction, they found no evidence of any past disposal activities. Although the property was previously owned by the Army and was used as an ammunition depot, they found no evidence of any bunkers, silos or buried material at the site. They indicated that silos are still present on adjacent property.

- 3. Disposition: No further action under this program. This facility has been regulated since its construction by the ADEM office. They are presently in the process of obtaining a TSD permit.
- 4. Comments: If not already done, the Kerr-McGee property should be investigated for remaining ammunition and disposition of material disposed there by the Army.

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT EPS FORM 3012-II

TELEPHONE LOG SHEET

1.	Site Identification:
	Site number: ALD000608224
	Site name: Kay-Fries Chemicals, Inc.
2.	Interview Data: (Party called)
	Name: Gaty Criscione
	Position: Production Supervisor
	Firm: Kay-Fries
	Addres\$.0. Box 889
	Theodore, Al 36590
	Telephone No.: (205) 653-5400
2	TDC Applicate Dates
3.	EPS Analyst Data:
	Name: Donalea Dinsmore
	Purpose of call: Directions to site, inquire about past disposition of site
	Form 2070-12 (7-81) P.N.
	Date of call: <u>8-10-8</u> 4
_	
4.	Interview Narrative Summary: Directions given to site. Site is on former
	Army property but didn't has have any evidence of any disposal. No
	ammo depots on siten. Nothing dug up durein construction. Depots were
	on Kerr-McGee property and can still see silos. Plant was constructed
	in 1980 and operations began in April 1981.
r-	Directified (General ex
5.	Disposition/Comments:
	No further action
6.	Comments: Any additional sites used by this company?
	Location:
	Dates of use:
	Description of waste:
	Comments:

ENVIRONMENTAL PROTECTION SYSTEMS, INC. Alabama RCRA 3012 Site Ranking Scheme EPS Form 3012-V

Site Name KAY- FRIES CHEMICALS INC Site Number ALDOOD 608224

Preliminary Assessment Ranking Scheme to Determine Which Sites Merit Further Action.

(Select one answer for each of the following seven questions)

1.	Are Hazardous Substances Present?		
	A. Confirmed on site!	10 points	
	B. Suspected at site!	5 points	
	C. It is unknown!	2 points	
	D. No hazardous substances	0 points	
	E. RCRA facility only!	0 points	X
2.	Is There a Pollution Dispersal Pathway?		
	A. Direct to surface and/or groundwater.	5 points	
	B. Indirect to surface and/or groundwater.	4 points	
	C. Suspected to surface and/or groundwater.	3 points	
	D. Not known for sure.	2 points	
	E. No pathway.	0 points	
3.	Characteristics of Human Population?		
٠.	A. High density.	5 points	
	B. Medium density.	4 points	
	C. Low density.	3 points	
	D. No population.	2 points	
	• •		
4.	Characteristics of Natural Environment?		
	A. Critical habitat including endangered		
	species, etc.	5 points	
	B. Sensitive habitat.	3 points	·
	C. Common less sensitive habitat.	2 points	
5.	How is Human Donulation Afforded Dy Sito?		
J .	How is Human Population Affected By Site? A. Public utility of drinking water		
	from site.	5 points	
	B. Direct public access to site.	4 points	
	C. Public access to affected	4 points	
	surface water.	3 points	
	D. Only potential for human		
	population contact.	2 points	
	E. Low or no potential for contact.	I point	
6.	Facility Management Practices at Site?		
	A. Site actively supervised and managed		
	currently with monitoring reports and		
	other permit and report requirements.	1 point	
	B. Site inadequately managed records		
	not up-to-date.	3 points	

	С.	Site not currently managed or regulated.	4 points	
	D.	Abandon site.	5 points	
7.		ential Responsible Parties for Site perations?		
		Controlling party identified and accepts responsibility for site.	1 point	
	В.	Suspected controlling party identified but does not accept responsibility	A points	
	С.	for site. No responsible party available.	4 points 5 points	
Rank	cing	Score =		
 #	0	x #2 + #4 + (#3 x #5) +	#6 #7	

TABLE 1. Ranking Assessment

NUMERICAL RANGE	PRIORITY ASSESSMENT
0-50	NONE
50-150	LOW
150-300	MEDIUM
300-450	HIGH
300-430	niun

Ranking Score:

Priority Assessment: NONE

POTENTIAL HAZARDOUS WASTE TE PRELIMINARY ASSESSMENT EPS FORM 3012-1 EPS ANALYST/REVIEWER CHECKLIST

Site No. ALD 000608224 Site Name Kay-Frees

Instructions:

To be used in conjunction with EPA Form 2070-12 (7-81). Attach on inside front (site folder. Initial and date for all assessment entries under appropriate

part/subpart as completed. initial/date in black for final assessment; in red in higher level (additional) assessment is in order. Follow same procedure for

review process.

Review Codes:

1-Toxicology Review; 2-Chemical Review; 3-Ecology Review; 4-Chemical Engineer

Review; 5-Geotechnical Review; 6-Project Manager Review; 7-Final Review

Form 2070	Analyst/	Review	Review	Review	STATUS Review	Review	Review	Review
Part Number	Date	Code 1	Code 2	Code 3	Code 4	Code 5	Code 6	Code 7
1.1VI.	\$ 8/10/84		ļ		 	 	0. 101	0. 1010
-					ļ	 	Juw8/0	Jun 8/13
2.1.				ļ	ļ			
2.11.				ļ		ļ	ļ	
2.111.				ļ				
2.IV.								
2.V.								·
2.VI.								
		-						
3.1.								
3.11.A								
3.II.B								
3.11.C		······································		<u> </u>				
3.11.D								
3.II.E							 	
3.11.F								
3.II.G	_							
3.II.H	_	 						
3.II.I								
<u> </u>			 					
3.II.J			· · · · · · · · · · · · · · · · · · ·					
B.II.K								
3.11.L							<u> </u>	<u> </u>
M.II.M								
.II.N								
0.11.0								
.II.P								
.111.								
.IV.								
l	1			ì	1	· I		

^{*}No further assessment/review required, enter NA

LAND PROGRAM

- 4	. Installation EPA ID	Number: AlDiolo	01610181212141				
11	. Home of installation	: Kay-Frie	s, Inc.			···	
111	. Location of installa	flon: Rangeli	ne Road Extensio	n, Theodore			
	Theodore		Mobi		Alab (State		36582
	(City or Tour)		(Cour	n	(Sien	,,	(Zip Code)
, A	installation Contact		. Ramey		205	653-5400	
	hasto identification	(Name)			(Area Code)	(Telephone Numb	or)
15		cription of	C. Quentity	D. Amount of	Weste by Handiling Method		
Numbe	Hasto	Waste	Generated (LBS)	1. Handling Method	2. Quantity Stored, Treated		If-Site Trestment Recovery Facility
2			(25)	Code	Disposed, or	3. Quantity	4. Facility EPA
Line					Recovered On-Site		No./Recovery Facility Name
1.	landa eta di di di di di di di di di di di di di	id Sludge	118.700	080	118,700	118.700	ALD000622464
2.		Chloride	37,560	D80	37,560	37,560	ALD000622464
3.	Non- Hazardous Ammonium	Chloride	305,532	D 80	305.532	305.532	A1.D000622464
4.	and Aer	ation Basin Slud	ge				
	Non- Hazardous IBTO Sa	lt	53,100	D80	53,100	53.100	ALD000622464
~ ` ·	. Closure Cost Elitant	e for Facilities \$_	70,000	-	nd complete Attachment i) by Only) \$ n/a		22 23 24 25 26 2

Hely under sensity of law that I have personally examined and am familiar with the information submitted in this and all attached into and that besed on my inquiry of those individuals immediately responsible for obtaining the information I believe that the subaccurate and complete. I am sware that there are significant penalties for submitting false information

	4	Seate identif	B. Description of	C. Quantity	D. Amount of	Waste by Handling Method		
	au T	Muste Number	Weste	Generated (LBS)	1. Hand I Ing Method Code	2. Quantity Stored, Treated Disposed, or Recovered On-Site	Shipped to C	Piff-Site Trentment, Recovery Facility 4. Facility EPA ID No./Recovery Facility Name
	14	Non- Hazardous	MTMS Salt	71,200	D80	71,200	71,200	ALD000622464
	2.	Combustible Liqu id	Silanes Reboiler Bottoms	40,200	D80	40,200	40,200	ALD000622464
1 -		Non- Hazardous	CPTMO Salt	9,900	D80	9,900	9,900	ALD000622464
	4	D002	Holding Pond Sand and Gravel	285,500	D80	285,500	285,500	ALD000622464
_	54	D002	Caustic Wash Stripper Bottoms	2,625,294	т02 '	2,625,294	0	n/a
_	64	D003	Knock-out Pot Waste	30,000	т02	30,000	0	n/a
_	7.	5.5						
	•	To exp. 1						
	2							
1	0							
. T <u>1</u> (1							
11	2							· · · · · · · · · · · · · · · · · · ·
1	3							
1					1			
	Ţ							
1	•							
1	9							

ALADAM DEPARTMENT OF ENVIRONMENTAL MANAGEMENT Kay-Fries, Alabama, Inc.

1982 Hazardous Waste Generator and On-Site TSD Facility Annual Report

	tion of installation: Rangelli Theodore			Industrial Park				
(C	THEOGOTE	Mob	(Street or Rout	e Number) Alaba		36582		
	(City or Town) (County) (State) (Zip Code)							
	Allation Contact: Robert H. L.	ance		205	653-5400	, -		
IV. Inst	IV. Installation Contact: ROBERT R. Lance 205 553-5400 (Area Code) (Telephone Number)							
·					•			
A FPA	e Identification: B. Description of	C. Quantity	D. Amount of	Waste by Handling Method				
Wast	e Waste	Generated	i. Handling	2. Quantity		ff-Site Treatment		
Numb	or	(LBS)	Method Code	Stored, Treated Disposed, or	Jisposai, or 3. Quantity	Recovery Facility 4. Facility EPA ID		
Line				Recovered On-Site		No./Recovery Facility Name		
1. DOQ1	Filter Aid Sludge	161,150	D80	161,150	161,150	ALD000622464		
Non- Hazard	ous Ammonium Chloride	867,757	D80	867,757	867,757	ALD000622464		
Non- Hazard	ous Ammonium Chloride and	365,310	D80	365,310	365,310	ALD000622464		
, 4.	Aeration Basin Sludge							
Non- Hazard		64,500	D80	64,500	64,500	ALD000622464		
	(1)	more space is need	ed, check 🔀 a	nd complete Attachment 1)				

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the sub-

(Print or Type Name)

Plant Manager

(Title)

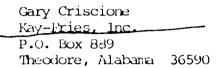
R. H. Lance

(Signature)

A. EPA	B. Description of	C. Quantity	D. Amount of	Waste by Handling Method									
Number	j]	₩as†e	Waste]		1	Generated (LBS)	1. Handling Method Code	2. Quantity Stored, Treated Disposed, or Recovered On-Site		ff-Site Treatment, Recovery Facility 4. Facility EPA ID No./Recovery Facility Name
Non- Hazardous	MTMS Salt	59,700	D80	59,700	59,700	ALD000622464							
D002	Caustic Wash Stripper Bottoms	2,485,010	ТО2	2,485,010	0	n/a							
D003	Knock-out Pot Waste	30,000	т02	30,000	0	n/a							
D001	Silanes Distillate Residu	e 25 ,2 30	Т02	25,230	0	n/a							
		-											

19

4AW-RM



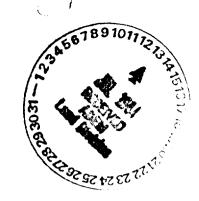
EPA I.D. Number ALD 000 608 224

Dear Mr. Criscione:

A formal request for Part B of your application for a hazardous waste facility permit under the Resource Conservation and Recovery Act (RCRA) has been made or will be made in the near future. To assist applicants in the preparation of their applications, EPA, Region IV, Residuals Management Branch, will be conducting comprehensive reviews of the facility's ground-water monitoring program. Site visits will be conducted by Harding Lawson Associates under contract to Region IV. The data review and program evaluation will be made by EPA. The results of the evaluation will be used to inform the applicant of deficiencies in the facility's existing groundwater monitoring program and what actions the applicant will need to take to collect the data needed to comply with 40 CFR 270.14(c) requirements.

As discussed on July 9, 1984, Harding Lawson personnel will visit your facility on July 17, 1984 to collect the data needed for the evaluation. Harding Lawson will need to review the following items. Please have this information available at the time of the site visit.

- 1) Copy of the facility's current Part A.
- 2) Hydrogeologic and engineering report on the installation of the monitoring system.
- 3) Copy of the facility's groundwater sampling and analysis plan.
- 4) Copy of the facility's groundwater quality assessment plan if an assessment is being conducted.
- 5) A map or plate showing the layout of the facility.
- 6) Copies of all groundwater analysis.
- 7) Results of any statistical analysis.



constray langer personnel will be extincting in conficer, dita outer

- 1) water level ansystions area the conterley epitem.
- z) 'actal depth of each well.
- 3) Felative elevation of each wall.
- 4) Distance between achitoring wells.
- 5) Distance from regulated unit(s) to remitering wells.

When the evaluation of your groundwater program has been completed, you will a inferred of the results.

To you have any questions or comments regarding time matter, please call for edichael Armett at 404/381-3667.

Sincerely yours,

James H. Courbrough, Chief Masicula Monagement Aranch

co: Aniel L. Coper/ Alaxama Department of Invironmental Lanagement

P.O. Box 889 P. 1997 P.O. Box 889 P.O. Box 889 P.O. Theodore, Alabama 36590 Telephone 205/653/5400

KAY-FRIES, ALABAMA, INC.

MEMBER Dynamit Nobel GROUP

June 15, 1984

Mr. Charles Fleming Alabama Division of Solid and Hazardous Waste 434 Monroe Street Montgomery, AL 36130

Dear Mr. Fleming:

We are proposing to produce a new product, Hexamethyl Di Silizane (HMDS), in our silanes/silicates process (2004). The raw materials used to produce HMDS are trimethylchlorosilane and ammonia. During the reaction, trimethylchlorosilane is completely reacted. Ammonia is added to the reaction until the reaction mixture changes from an acidic nature to a basic one. Therefore, there may be a slight amount of excess ammonia. This ammonia is picked up in the Ammonium Chloride biproduct that is produced. The majority of the ammonium chloride produced during the reaction will be removed by centrifuging it in the silanes process area. However, there will be a slight amount of ammonium chloride (in a hexane water solution) that won't be centrifuged. This solution will be contained in a hold tank and pumped over to the orthoester process. Once in the orthoester process, the solution mixes with the orthoester ammonium chloride solution. At this time, the ammonium chloride is centrifuged while the excess water and hexane is sent to a stripper column. The stripper then separates the organic from the water taking the organic overhead and discharging the water out the bottom of the column to waste treatment. The organic that is taken overhead goes to a burn tank and is burned in our Thermal Oxidizer.

Enclosed are the safety data sheets for the materials used and produced in this process. If you have any questions or need any further information, please feel free to contact me. Thank you for your cooperation.

Sincerely,

KAY-IRIES, INC.

Gary S. Criscione Production Manager



ADEIV

at 1

15 634 %

d.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

1 17

September 29, 1983

MEMORANDUM

TO:

Buddy E. Cox, Jr. B4

FROM:

Mike C. Smith [6]

RE:

Kay-Fries Liner Repair

Gary Cricione called to update the referenced repair project.

The holding pond liner has been removed and is being stored in a diked area. Sand, pea gravel and some clay has been removed and placed in drums. All this is to be disposed of at CWM. Removed clay will be replaced with new clay (as proposed) and new liner (double/Gendle HPDE) with vent system.

The aeration basin material has been pumped to the holding pond and is being aerated to serve as a temporary aeration basin. Kay-Fries is now in the process of removing the aeration basin sludge and liner. Sand and gravel removed from this basin, along with the sludge, will be applied to the land at the site as fertilizer. Analytical results indicate that this material is non-hazardous. John Poole has been contacted by Kay-Fries and has no problem with this procedure.

The process is to be completed by October 4, 1983. I told Gary we would like to see the completed aeration basin before it is re-filled.

MCS:Is

P.O. Box 889
Theodore, Alabama 36590
Telephone 205/653/5400

KAY-FRIES, ALABAMA, INC.

MEMBER Dynamit Nobel GROUP

July 6, 1983

Mr. Mike Smith
Alabama Division of Solid
and Hazardous Waste
434 Monroe Street
Montgomery, AL 36130

Dear Mr. Smith:

Included in this Hazardous Waste Generator report is all the material we have sent to the Chemical Waste landfill in Emelle, Alabama. Please note that the majority of this material is not considered hazardous waste, but we are taking no chances with it and are sending it to Chemical Waste Management anyway along with the proper manifests.

Let me know if you need any further information or if you have any questions.

Sincerely,

KAY-FRIES, INC.

Gary S. Criscione Process Engineer

GSC/drh

cc: J. M. Edwards

R. H. Lance



WASTE GENERATOR REPORT (NONHAZARDOUS)

Kay-Fries, Inc.

DATE ISSUED	MANIFEST NUMBER	MATERIAL	AMOUNT AND WEIGHT
11/15/83	CWMA-70254	MTMS Salt IBTMO Salt	40 drums - 12,000 lbs. 39 drums - 11,700 lbs.
12/9/83 12/28/83	CWMA-70255 CWMA-70256	Ammonium Chloride MTMS Salt MTMS Salt CPTMO Salt	9 drums - 2,700 lbs. 60 drums - 15,000 lbs. 65 drums - 19,200 lbs. 3 drums - 900 lbs.

WASTE GENERATOR REPORT (HAZARDOUS)

DATE ISSUED	MANIFEST NUMBER	MATERIAL	AMOUNT AND WEIGHT
10/3/83	CWMA-70251	Filter Aid Sludge	47 drums - 14,100 lbs.
10///02	OTRA 700/7	Silanes Reboiler Bottoms	34 drums - 10,200 lbs.
10/4/83	CWMA-70247	Holding Pond Sand and Pea Gravel	79 drums - 55,300 lbs.
10/5/83	CWMA-70248	Holding Pond Sand and	77 020
10/6/02	CIRCL 700/0	Pea Gravel	82 drums - 57,400 lbs.
10/6/83	CWMA-70249	Holding Pond Sand and Pea Gravel	80 drums - 56,000 lbs.
10/10/83	CWMA-70250	Holding Pond Sand and	50,000 Ibs.
		Pea Gravel	80 drums - 56,000 lbs.
10/12/83	CWMA-70252	Holding Pond Sand and	56 000 11
10/27/83	CWMA-70253	Pea Gravel Holding Pond Sand and	80 drums - 56,000 lbs.
10,27,03	OW. II. 70293	Pea Gravel	8 drums - 4,800 lbs.
		Filter Aid Sludge	41 drums - 12,300 lbs.
- 0 10 100		Silanes Reboiler Bottoms	
12/9/83	CWMA-70255	Filter Aid Sludge	
12/28/ 83	CWMA-70256	Silanes Reboiler Bottoms	21 drums - 8,400 lbs.

DATE ISSUED	MANIFEST NUMBER	MATERIAL	AMOUNT AND WEIGHT
4/1/83	CWMA-59619	Ammonium Chloride and Aeration Basin Sludge	$16 \text{ yds}^3 - 17,712 \text{ lbs.}$
4/21/83	CWMA-59620	Filter Aid Sludge	83 drms - 24,900 lbs.
5/4/83	CWMA-70233	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 1bs.
5/9/83	CWMA-70234	Ammonium Chloride Filter Aid Sludge	52 drms - 17,160 lbs. 31 drms - 9,300 lbs.
5/12/83	CWMA-70235	Ammonium Chloride and Aeration Basin Sludge	$18 \text{ yds}^3 - 19,926 \text{ lbs.}$
5/20/83	CWMA-70236	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 1bs.
5/23/83	CWMA-70237	IBTMO Salt Ammonium Chloride	54 drms - 16,200 lbs. 35 drms - 10,500 lbs.
5/26/83	CWMA-70238	Ammonium Chloride and Aeration Basin Sludge	$18 \text{ yds}^3 - 19,926 \text{ lbs.}$
6/3/83	CWMA-70239	Ammonium Chloride and Aeration Basin Sludge	$18 \text{ yds}^3 - 19,926 \text{ lbs.}$
6/7/83	CWMA-70240	MTMS Salt Ammonium Chloride	63 drms - 15,750 lbs. 24 drms - 7,200 lbs.

Date Issued	Manifest Number	Material	Amount and Weight
1/8/83	CWMA-59611	Ammonium Chloride and Aeration Basin Sludge	17 yds ³ - 18,819 1bs
1/12/83	CWMA-59612	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 1bs
1/15/83	CWMA-59613	Ammonium Chloride and Aeration Basin Sludge	17 yds ³ - 18,819 1bs
1/18/83	CWMA-59614	Ammonium Chloride and Aeration Basin Sludge	$16 \text{ yds}^3 - 17,712 \text{ lbs}$
1/21/83	CWMA-59615	Ammonium Chloride and Aeration Basin Sludge	17 yds ³ - 18,819 1bs
1/24/83	CWMA-59616	Ammonium Chloride and Aeration Basin Sludge	17 yds ³ - 18,819 1bs
2/9/83	CWMA-59617	CPTMO Salt Filter Aid Sludge	32 drums - 9,600 lbs 53 drums - 21,200 lbs
2/28/83	CWMA-59618	Ammonium Chloride and Aeration Basin Sludge	16 yds ³ - 17,712 lbs.

Date Issued	Manifest Number	Material	Amount and Weight
10/3/82	CWMA-44647	Ammonium Chloride and	17 yds ³ - 18,819 1bs.
10/8/82	CWMA-44648	Aeration Basin Sludge MTMS Salt	51 drums - 15,300 lbs.
10/0/02	CWMA-44649	Filter Aid Sludge Ammonium Chloride	31 drums - 12,400 lbs. 13 drums - 3,900 lbs.
10/8/82		Ammonium Chloride and Aeration Basin Sludge	$18 \text{ yds}^3 - 19,926 \text{ lbs.}$
10/13/82	CWMA-44650	Ammonium Chloride and Aeration Basin Sludge	$18 \text{ yds}^3 - 19,926 \text{ lbs.}$
10/17/82	CWMA-44651	Ammonium Chloride and Aeration Basin Sludge	18 yds ³ - 19,926 lbs.
10/21/82	CWMA-59592	Ammonium Chloride and Aeration Basin Sludge	$18 \text{ yds}^3 - 19,926 \text{ lbs.}$
10/26/82	CWMA-59593	Ammonium Chloride	18 yds ³ - 19,926 lbs.
10/29/82	CWMA-59594	Ammonium Chloride	$16 \text{ yds}^3 - 17,712 \text{ lbs.}$
11/2/82	CWMA-64504	Ammonium Chloride and	$17 \text{ yds}^3 - 18,819 \text{ lbs.}$
22/2/02		Aeration Basin Sludge	1, ,10 10,015 1101
11/4/82	CWMA-59596	MTMS Salt	60 drums - 18,000 lbs.
		Ammonium Chloride	36 drums - 10,800 lbs.
11/6/82	CWMA-59597	Ammonium Chloride and Aeration Basin Sludge	$18 \text{ yds}^3 - 19,926 \text{ lbs.}$
11/10/82	CWMA-59598	IBTMO Salt	56 drums - 16,800 lbs.
		Ammonium Chloride	32 drums - 9,600 lbs.
		Filter Aid Sludge	8 drums - 3,200 lbs.
11/19/82	CWMA-59599	Ammonium Chloride and	$18 \text{ yds}^3 - 19,926 \text{ lbs.}$
		Aeration Basin Sludge	10 ,10 1,,,10 1,00
11/23/82	CWMA-59600	Ammonium Chloride and	$16 \text{ yds}^3 - 17,712 \text{ lbs.}$
		Aeration Basin Sludge	27,122 2201
11/29/82	CWMA-59601	Ammonium Chloride and	$18 \text{ yds}^3 - 19,926 \text{ lbs.}$
		Aeration Basin Sludge	2
12/4/82	CWMA-59602	Ammonium Chloride and	18 yds ³ - 19,926 lbs.
		Aeration Basin Sludge	
12/8/82	CWMA-59603	Ammonium Chloride and	18 yds ³ - 19,926 1bs.
		Aeration Basin Sludge	
12/13/82	CWMA-59604	Ammonium Chloride and	17 yds ³ - 18,819 1bs.
10/17/00	CIRCL 50605	Aeration Basin Sludge	
12/17/82	CWMA-59605	Ammonium Chloride and	17 yds ³ - 18,819 lbs.
10/01/00	CLIMA EOCOC	Aeration Basin Sludge	16 13 17 710 11
12/21/82	CWMA-59606	Ammonium Chloride and	$16 \text{ yds}^3 - 17,712 \text{ lbs.}$
12/21/82	CLIMA - 50609	Aeration Basin Sludge	1/ 1 / 200 11
12/21/02	CWMA-59608	IBTMO Salt	14 drums - 4,200 lbs.
12/22/82	CWMA-59609	Ammonium Chloride	74 drums - 22,200 lbs.
12/22/82		Filter Aid Sludge	83 drums - 33,200 lbs.
14/30/04	CWMA-59610	Ammonium Chloride and	16 yds ³ - 17,712 lbs.
		Aeration Basin Sludge	

Date Issued	Manifest Number	Material		Amount and Weight
7-2-82	CWMA-44629	Ammonium Chloride	19	cu.yds 21,033 lbs.
7-7-82	CWMA-44630	Ammonium Chloride	19	cu.yds 21,033 lbs.
7-14-82	CWMA-44631	Ammonium Chloride	19	cu.yds 21,033 lbs.
7-20-82	CWMA-44632	Ammonium Chloride	18	cu.yds 19,926 lbs.
8-10-82	CWMA-44633	Ammonium Chloride	18	cu.yds 19,926 lbs.
8-17-82	CWMA-44634	Ammonium Chloride	18	cu.yds 19,926 lbs.
8-21-82	CWMA-44635	Ammonium Chloride	18	cu.yds 19,926 lbs.
8-28-82	CWMA-44636	Ammonium Chloride & Aeration Basin Sludge	18	cu.yds 19,926 lbs.
9-2-82	CWMA-44637	MTMS Salt	88	drums - 26,400 lbs.
9-2-82	CWMA-44638	Ammonium Chloride	18	cu.yds 19,926 lbs.
9-3-82	CWMA-44639 ~	Filter Aid Sludge	81	drums - 28,350 lbs.
9-7-82	CWMA-44640	Ammonium Chloride	18	cu.yds 19,926 lbs.
9-11-82	CWMA-44641	Ammonium Chloride	18	cu.yds 19,926 lbs.
9-15-82	CWMA-44642	Ammonium Chloride & Aeration Basin Sludge	17	cu.yds 18,819 lbs.
9-20-82	CWMA-44643	Ammonium Chloride & Aeration Basin Sludge	17	cu.yds 18,819 lbs.
9-21-82	CWMA-44644	Ammonium Chloride iBTMO Salt		drums - 5,300 lbs. drums - 20,700 lbs.
9-24-82	CWMA-44645	Ammonium Chloride	17	cu.yds 18,819 lbs.
9-28-82	CWMA-44646	Ammonium Chloride	17	cu.yds 18,819 lbs.

Date Issued	Manifest Number	Material	Amount and Weight
4/4/82	CWMA-31652	Ammonium Chloride	20 cu.yds 22,140 lbs.
4/8/82	CWMA-31653	Ammonium Chloride	19 cu.yds 21,033 lbs.
4/12/82	CWMA-31681	Ammonium Chloride	19 cu.yds 21,033 lbs.
4/16/82	CWMA-31682	Ammonium Chloride	19 cu.yds 21,033 lbs.
4/19/82	CWMA-31683	Ammonium Chloride	19 cu.yds 21,033 lbs.
4/23/82	CWMA-31684	Ammonium Chloride	19 cu.yds 21,033 lbs.
5/14/82	CWMA-44626	Ammonium Chloride	19 cu.yds 21,033 lbs.
6/25/82	CWMA-44627	Ammonium Chloride	19 cu.yds 21,033 lbs.
6/28/82	CWMA-44628	Filter Aid Sludge	80 drums - 28,000 lbs.

HAZARDOUS WASTE GENERATOR REPORT Kay-Fries, Inc.

Date Issued	Manifest Number	<u>Material</u>	Amount and Weight
1-5-82	CWMA 30753	Ammonium Chloride	96 dr 28,800 lbs.
1-8-82	CWMA 30754	Ammonium Chloride	96 dr 28,800 lbs.
2-2-82	CWMA 30755	Ammonium Chloride	96 dr 28,800 lbs.
2-8-82	CWMA 31638	Ammonium Chloride	96 dr 28,800 lbs.
2-11-82	CWMA 31639	Filter Aid Sludge	80 dr 28,000 lbs.
2-19-82	CWMA 31640	Ammonium Chloride	96 dr 28,800 lbs.
2-19-82	CWMA 31641	Ammonium Chloride	88 dr 26,400 lbs.
3-1-82	CWMA 31642	Ammonium Chloride	21 cu. yds 23,247 1bs.
3-5-82	CWMA 31643	Ammonium Chloride	92 dr 27,600 lbs.
3-8-82	CWMA 31644 ~	Ammonium Chloride	21 cu. yds 23,247 lbs.
3-9-82	CWMA 31645	Ammonium Chloride	20 dr 8,000 lbs.
		iBTMO Salt	76 dr 22,800 lbs.
3-14-82	CWMA 31646	Ammonium Chloride	21 cu. yds 23,247 1bs.
3-19-82	CWMA 31647	Ammonium Chloride	21 cu. yds 23,247 1bs.
3-22-82	CWMA 31648	Filter Aid Sludge	80 dr 28,000 lbs.
3-23-82	CWMA 31649	Ammonium Chloride	21 cu. yds 23,247 lbs.
3-27-82	CWMA 31650	Ammonium Chloride	21 cu. yds 23,247 1bs.
3-30-82	CWMA 31651	Ammonium Chloride	21 cu. yds 23,247 lbs.

YW KAY PAIES (MOBILE CO)

Rockleigh, NJ 07647 Telephone (2011-784-0200)

96°

KAY-FRIES, INC.
MEMBER Dynamil Nobel GROUP

DEC 1982

RECEIVED

December 15, 1982

Solid Waste

95782

Mr. Bernard E. Cox, Chief Hazardous Waste Section State of Alabama Dept. of Environmental Management State Capital Montgomery, AL 36130

RE: Interim Hazardous Waste Permit EPA I.D. No. ALT 000608224

Dear Mr. Cox:

We are enclosing duplicate copies of Part A of the RCRA permit application covering our Kay-Fries Alabama, Inc. plant referenced above.

You will note that Form 3 of Part A is revised in the manner discussed with you and with Mr. John Harvanek of EPA, Region IV, to reflect regulatory revisions and processing changes that have occurred since the interim permit was effected.

The revisions are described as follows:

1. Form 3 - III Processes

Form 3, page 1 of 5, previously listed on line 4, an incinerator TO3 with capacity of .17 tons per hour and on line 2, a feed tank SO2 for the incinerator with capacity of 3000 gallons. These listings are removed because the equipment is actually a waste heat boiler supplying steam for processing, reference 40CFR 261.2 (b) (2). The waste which is burned is equivalent to 10,000 cu. ft. of natural gas and provides approximately 20% of the processing heat requirement.

2. Form 3 - IV Description of Hazardous Waste

Form 3, page 3 of 5, previously listed on line 1 - F005 1,196,000 pounds of waste for treatment in a surface impoundment. This designation is incorrect because the waste does not fit into any of the listed specific or non-specific hazardous waste categories. Based upon analysis, this stream should be listed as DOO2 Corrosive. The quantity has also been corrected to 2,883,000 pounds.



Form 3, page 3 of 5 previously listed on line 2, material which is part of the waste treated in the surface impoundment. It is deleted because it is included in line 1.

Form 3, page 3 of 5 previously listed on lines 3, 4, 5 and 6, streams which are burned in the waste heat boiler. These wastes are now deleted because the boiler is exempted under 40 CFR 261.2 (b) (2).

Form 3, page 3 of 5 of the revised application includes on line 2 a new listing of ignitable waste code D001 which is stored in drums and periodically shipped to the Chemical Waste Management secure landfill at Emelle, Alabama.

Form 3, page 3 of 5 of the revised application designates on line 3, a new listing of ignitable waste D001 which is collected in drums previous to treatment along with item 1 in the surface impoundment.

Form 3, page 3 of 5 of the revised application also includes on line 4 and 5, a new listing of waste material which is D002 Corrosive and D003 reactive with water. This material is collected in drums previous to treatment after which it is discharged to the surface impoundment of line 1.

We believe this revised application accurately portrays our waste situation. If you have any questions, please contact me at the above address, or Mr. Robert H. Lance, Plant Manager, Kay-Fries Alabama, Inc., P. O. Box 889, Theodore, Alabama 36590.

Very truly yours,

Edward G. Opdyke

Executive Vice President

Edward & Opdyke

EGO:mja Enclosures

cc: Mr. John M. Harvanek III, P.E.
Environmental Engineer, Reg. IV
United States Environmental
Protection Agency
345 Courtland St., N.E.
Atlanta, Georgia 30365



Jordon Jones & Goulding Inc. Consulti. __ Engineers

2000 CLEARVIEW AVE., N.E., SUITE 200, ATLANTA, GEORGIA 30340, PHONE (404) 455-8555

RECEIVED

APR 1 1980

March 24, 1980

DIVIDIO IN THE STATE OF THE STA

Mr. Dan Cooper
Deputy Director
Division of Solid Waste & Vector Control
Environmental Health Adm.
State Office Building
Montgomery, Alabama 36130

Dear Mr. Cooper:

Thank you for the time you and your staff spent with me on February 8, 1980, discussing Alabama's current solid waste disposal regulations. To review our interest, Kay-Fries, Inc. is planning to construct an organic chemical manufacturing facility in the Theodore Industrial Park, Theodore, Alabama, and will generate a sludge from their biological wastewater treatment facility. Current plans are to dewater this sludge and dispose of the dried cake at an offsite location. Our firm, Jordan, Jones & Goulding, Inc., is providing Kay Fries with consulting engineering services in several areas, including applications for permits from the appropriate regulatory agencies.

Since vour previous correspondence with Kay-Fries in May, 1978, the production aspect of their proposed plant has been modified. Current plans are to produce a group of organic chemical intermediates, specifically orthoformates and silanes. Start-up of the manufacturing facility is scheduled for spring, 1981. The process wastewater, as well as rainfall from some potentially contaminated areas such as pump pads and around storage tanks, will be collected and treated in an activated sludge treatment system at a rate of 50 qpm. Excess waste activated sludge will be dewatered using a filter press to an expected cake solids content of 30-40 percent. Sludge conditioning with lime and ferric chloride will aid in achieving this easily handled cake.

To confirm our discussion, the Federal regulations regarding classification and disposal of hazardous wastes (40 CFR 250) are currently in a proposed form, although EPA is slated to issue a final version within a few months. The Alabama Department of Public Health will modify their regulations to reflect the Federal version. In summary, if the dewatered sludge is classified as hazardous, disposal in a secured landfill is required. If the waste is classified as non-hazardous, Kay-Fries has the option of using an approved on-site landfill or an off-site sanitary landfill, the nearest one being in Irvington, Alabama.

Mr. Dan Cooper Page 2 March 24, 1980

As you know, the only available sludge for testing purposes is from a bench scale treatability study being conducted at Kay-Fries' New York plant. While mixed liquor solids are available, a dewatered sludge representative of the filter press cake is not.

It is estimated, based on assumed sludge production and decay coefficients, that 197 lhs./day of excess dry solids will be generated from the activated sludge treatment plant. Following chemical addition and dewatering, there will be 1150 lbs./day, or 16 cu. ft./day of dewatered cake to dispose of in a landfill.

In reviewing the proposed hazardous waste regulations dated December 18, 1978, Kay Fries' sludge is not classified as hazardous under sections 250.14 (a) or (b). Furthermore, none of the parameters identified under 250.13 (d) (2) (ii) for toxic wastes are used in their manufacturing process. Based on the available information and the proposed regulations, it does not appear that Kay Fries' sludge will be classified as hazardous. It is suggested, because the Federal and State regulations relative to hazardous waste disposal are not final and are likely to change before the plant begins operation and because any testing done now would have to be repeated on the dewatered sludge from the full scale operation, that Kay-Fries forego further analysis of their sludge for the purpose of determining whether or not it is hazardous. Once the full scale plant is in operation, Kay-Fries will make the necessary analyses in accordance with regulations current at that time to determine whether or not their sludge is classified as hazardous. Any necessary permits for disposal of the sludge will also be obtained at that time.

By taking this course of action, Kay-Fries assumes that they will be given adequate time to get their waste treatment plant functioning properly and to perform the necessary testing of their sludge. Your written concurrence with this course of action is requested. Kay-Fries recognizes its responsibility to provide for the safe disposal of this sludge and will comply with Federal or State laws and regulations regarding sludge disposal. Please let me know if any further information is needed at this time.

Very truly yours.

JORDAN, JONES & GOULDING, INC.

in allesting in

Don Allen

DA/bi

cc: Bob Lance George Bitler Dr. Ken Kelly

erLaboratories

.nesterEngneers

aopolis Zennsylvania 15108 Phone (412) 262 1035

Laboratory Analysis Report For

Kay Fries Alabama, Inc.

Samples Received:

12/11/81

Report Date:

3/8/82

	Sludge Sample
Source	Clarifier Overflow
Log No. 81-	7532
Date Collected	12/10/81
рН	8.8
Flash Point, °F	>200
Reactivity Corrosivity	Non-Reactive Non-Corrosive
•	
Methanol, mg/L	1,099
Total Cyanide, mg/L CN	1.78 0.074
Amenable Cyanide, mg/L CN Acetonitrile, mg/L	2.6
Diethyl Benzene, mg/L	70.3
Ethanol, mg/L	<1.0
Dimethyl Ether, mg/L	<1.0
Methyl Formate, mg/L	<1.0
Ethyl Formate, mg/L	<1.0
Ethyl Chloride, mg/L	<1.0
Methyl Acetate, mg/L	<1.0 0.012
Methylene Chloride, mg/L Triethyl Orthoformate, mg/L	√1.0
Trimethyl Orthoformate, mg/L	<1.0
Trimethyl Orthoacetate, mg/L	<1.0
Chloride, mg/L Cl	2,050
EP Toxicity Test:	
Н	7.0
Arsenic, mg/L As	<0.001
Barium, mg/L Ba	0.2
Cadmium, mg/L Cd	0.01 0.02
Chromium, mg/L Cr Lead, mg/L Pb	<0.02
Mercury, mg/L Hg	<0.001
Selenium, mg/L Se	<0.001
Silver, mg/L Ag	<0.01

Unless otherwise noted, analyses are in accordance with methods and procedures outlined and approved by the Environmental Protection Agency and conform to quality assurance protocol.

^{• &#}x27;Less than' (<) values are indicative of the detection limit.

I/W- Kay. Frais Chimiss Molele Co. July 10, 1979 Kay-Fries Chemicals, Inc. Stony Point New York, New York 10980 Attention: Mr. Stephen A. Turek Senior Project Engineer Dear Mr. Turek: We are in receipt of a permit application for refuse disposal for your proposed plant in Theodore Industrial Park, Mobile County, Alabams. The permit application was submitted to us by Mr. James W. McInnis, Jr., Mobile County Health Department, for proper processing. The information contained in the permit application for refuse disposal does not sufficiently detail waste streams in question, therefore, we must request that more information regarding the expected quantity and chemical characteristics of each waste stream involved be forwarded to this office for review. The requirement for waste stream analysis was previously addressed in Mr. Dan E. Cooper's letter of May 25, 1978, to Dr. Kenneth W. Kelley, of your firm. A copy of Mr. Cooper's letter is enclosed for your information and use. If you should have any questions, please contact us. Our telephone

number is (205) 832-6728.

Sincerely,

Wede Pitchford Public Health Engineer Division of Solid Waste & Vector Control Environmental Health Administration

GWP:alr

Enclosure

CC: Mr. James W. McInnis Mobile County Health Department ARY 1200 ft. MELNT. SHIP & DISUM STARAGE BLOS. WAREHOUSE 75 ft. 225 ft. LRG E zó EQUALIZATION LACOON ~ ORTHOSSIER C.R. 40 ft. 30 ft. EVELOPKENT ESSET OF THE F MIONE, RIBBART VES, ING PROPERTY BOUNDARY 1181 ft. IN THIS DIRECTION FROM LINE B Scale Palen

Fr. 12. 12. 12. 22. 22

